

In This Issue—*Business Results of New York Show*

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MOTOR AGE

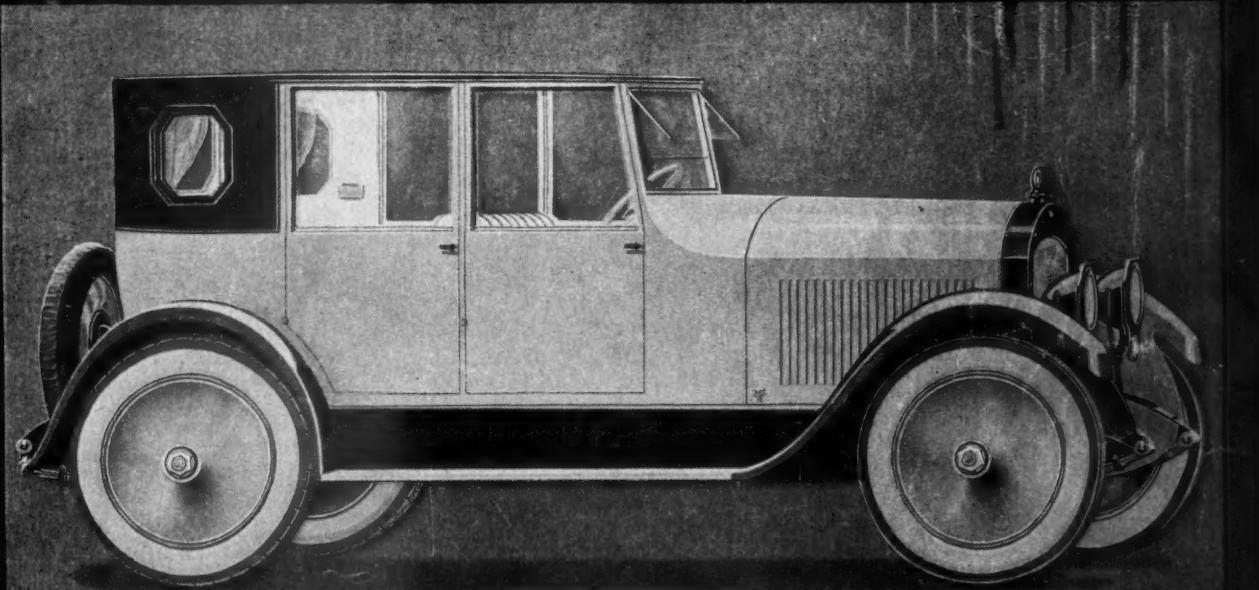
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Volume XXXIX
Number 3.

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CHICAGO, JANUARY 20, 1921

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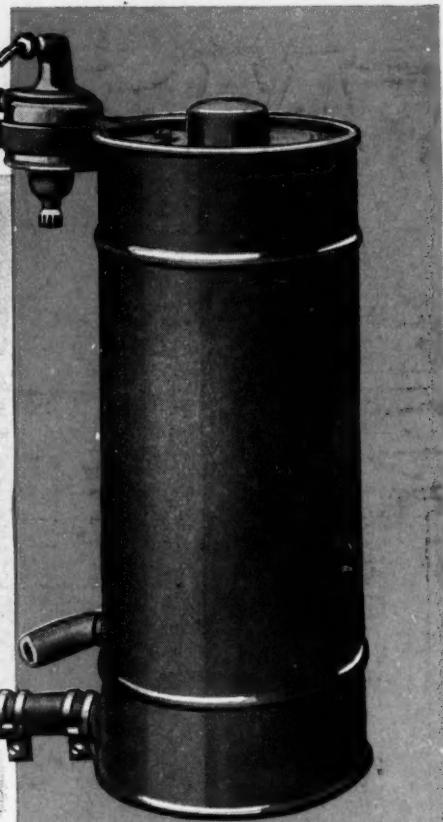
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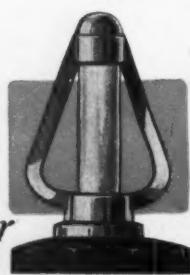
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MOTOR AGE

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At each stroke of the valve the outside edges of the laminations are flexed the minutest fraction of an inch—sufficient, however, to scrape the valve seat and keep it free of carbon deposits. Valve trouble is eliminated at the source.

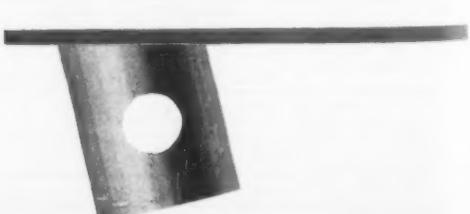
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New York Show Aftermath

Your particular attention is called to the news dispatches and articles about the New York Show in this number.

Naturally the automotive trade is anxiously waiting to learn about the results of the season's first exposition and every effort has been made by our editorial staff to determine as nearly as possible the results accomplished.

Needless to say, the dealer who is going to be rewarded during 1921 is the merchant who has his ears close to the ground, who closely watches developments and keeps fully abreast of the times. To do this, it is almost essential that you pay particular attention to the news appearing in your business paper. Do so and you will be kept in constant touch with the progress of the shows. And, what's more, you will get a better knowledge of the changing habits and moods of the buying public—your clients.

Remember that 1921 will reward you to the extent of the effort you put behind your business—the amount of ammunition you obtain and the fighting spirit you develop.

Why?

MOST dealers have known that the Columbia Six has proven one of the most profitable and stable lines in the entire automotive field.

Many dealers who are planning on changing their lines for the coming season will be interested in knowing why.

In the Show issue of MOTOR AGE, January twenty-seventh, we will publish a two-page report of a typical Columbia dealer's business which will tell why very definitely.

Instead of the usual generalities, this report will contain only definite facts and figures, such as yearly increases, percentage of service cost, re-sale values, average percentage of cars in the service station, and a variety of other facts which will give any dealer a definite idea of what he could reasonably expect to do with the Columbia line.

We have run off a few advance copies of this report which we will be glad to send to any dealers who are interested in making an immediate change in their lines.

THE COLUMBIA MOTORS CO.
DETROIT, U. S. A.

Columbia Six



MOTOR AGE

NEW YORK SHOW STIMULATES BUYING

*Buyers Back in the Market—After Long Holding Off
They Find the Need of an Automobile So Great They
Are Ready to Talk Business*

DEALERS ATTENDING MANY AND ENTHUSIASTIC

THE New York show surpassed the highest hopes of the exhibitors in the actual sales developed.

Nearly every New York dealer and factory branch reports from two to forty actual sales at the exhibits, while the number of live prospects revealed is greater than at any recent show.

Comparison with last year's show indicates that on the whole the exhibitors are selling an average between 50 and 75 per cent of the cars they sold at the 1920 show, the individual percentages running from 20 to 110. Sales are well up to the average of past years, the New York show never having been regarded primarily as a selling show.

It should be kept in mind that conditions are so vastly changed this year that a comparison with last year is apt to be very misleading. In all classes there was a great demand last year from the newly prosperous class—mechanics, small storekeepers and manufacturers, who had accumulated the price of a car and a desire to own one through war prosperity. This year, this element is not present, but instead a type of prospect that appears to be nearer the solid class that is motor wise, knows about what he wants and makes intelligent inquiries at the exhibits.

As the show progressed there was less talk by the visitors about prices. During the first day or so the prospect with price his predominant consideration was numerous. But when the show continued and the downward trend that was expected did not materialize, the show visitors seemed to realize that it was not probable that further reductions would be made at least until the expiration of the guarantee period, and began buying.

In summary, it may be said that show sales of the higher priced cars—above \$3000—ran about 50 per cent below those of last year. Contracts in the \$1500 to \$3000 class aggregated about 75 per cent of 1920 and those in the class below \$1500 a little less than 75 per cent.

The show has not put buying back on a normal basis. No one expected it would. But it has broken the apathy of the metropolitan buying public and with an attendance even greater than that of last year it has put new spirit into the organizations selling automobiles in New York and the entire eastern territory.

Here is the kernel of the story. Not a single New York distributor or branch manager went into the show with any idea that results would come anywhere near those of previous years. They were optimistic—the show radiated cheer in every nook and corner—but down in their hearts the sales executives realized that they were facing a buying public with

the reins in its own instead of the sellers' hands, with its purchasing power materially depreciated and with its thoughts turned away from buying, and they were prepared to be encouraged if actual sales mounted to a quarter of the average at a New York show. What happened is accepted both by manufacturing and merchandising executives who have been in conference throughout the week as evidence that the tide has turned, that buyers are back in the market and that a rising curve of sales may be expected as Spring comes on.

No one can say what will be the after-effect of the show. There is a possibility, but not much probability that sales may recede toward the near stagnation which prevailed as the old year passed out. The logical assumption is that with prospect lists obtained at the show, which are far better than those of previous years in size and quality, the metropolitan and suburban dealers, by hard work, will be able to turn some of the thousands of show inquiries into cash and do considerable business between now and the opening of the spring season.

Quality in the show crowds was a notable feature of the 1921 exposition. With fewer complimentary tickets issued the attendance was fully 10 per cent within last year's and there were fewer idle spectators. A good many people who came to the show last year just to look upon a spectacle seemed to have other uses this week for the 75 cents demanded at the gate. There was less milling around the aisles and there were more people inside the exhibits. There were more interviews by salesmen, who were at a loss in some cases to explain why people should have been more willing than formerly to give their names for prospect lists. When the phenomenon was reported to the dealers there was general agreement that many people were getting to the point, after long holding off, where the need or desire to own an automobile or replace one already in use was so strong that they were ready to talk business. In fact, the percentage of prospects giving a definite date when they expected to buy was unusually high. One exhibitor who checked up the prospect list obtained at the show found on it 400 names that were not on his pre-show lists.

One striking point in observation of the show was the work of the men in the exhibits. There was some poor salesmanship, some attempts by men who could not talk intelligently about their product to meet people who had owned and driven cars for years. But this sort of thing did not get far. Poorly manned exhibits were poorly patronized—quite a few of them reported not a single sale—but the exhibits with well informed, hard working staff reaped the rewards of efficient effort. One car in the lower priced class, which formerly had little real

competition, made a record of fourteen sales—not much of a record in comparison with eighty-two at another show when the competitive cars were just coming into production and yet had to make their name. But only two or three exhibits claimed more than fourteen sales and in this exhibit, with its fourteen sales, the staff had to work hard and intelligently to make even that many. The dealer in charge said that at the show and before the show his men had put in on every contract the effort that used to close ten, which may be accepted as an indication of the sort of selling that must prevail in the trade from now on.

With No Extravagant Claims, New York Show Did What It Set Out to Do

IN this picture of the New York Show as an agency of sales MOTOR AGE gives no figures of business done by the various exhibitors. Editors who obtained the information made it plain to the distributors and branch managers they talked with that they would not be quoted. It was desired that there be entire avoidance of the possibility of meaningless "claims" regarding sales. The men interviewed were asked to state the exact truth and as far as we know did so in all cases, realizing that empty optimism would deceive the trade throughout the country and perhaps lead to business expansions not justified by conditions.

The story pictures the show as a decided success in reviving public interest in the automobile and in preparing the ground for future sales. In the matter of show sales it fell only 25 to 50 per cent below last year's exposition, when getting a signature to a contract was almost as easy as ordering lunch. In actual selling the show went far ahead of the highest hopes of the exhibitors. It indicated a steady return of buying and showed that hard work, the basis of selling, will speed the return.

these stocks still existent in made to add to the dealers' burdens. There was a general disposition of the manufacturer and distributor to meet the dealer's needs about as he stated them, which means that production from now on will be held pretty closely to apparent demand.

The New York Show squelched all the rumors that the public had turned against the automobile and that the day of the motor car show as an event in the life of a great city had passed. Afternoon and evening, from the first to the final Saturday of the show, the crowds were tremendous and the exhibits in the hotels were well patronized too. The newspapers gave the show more than "publicity"—the better ones studied it both from engineering and merchandising viewpoints and printed some informative and helpful stories. All New York and a large surrounding territory has been reading, talking and thinking automobiles for a week, results of which already are apparent, with a continuation of these results inevitable.

The trade in New York, in fact the entire industry, got out of the show well founded indication of a return of buying and plenty of encouragement to believe that the shows, supported by intelligent, hard work, will speed the return.

Features of 1921 Engines from the Viewpoint of the Service Man

Accessibility Given Greater Consideration—Designers Have Realized the Importance of Saving Time in Making Adjustments and Repairs

BEFORE car makers gave maintenance and service the recognition they are getting today, it was not uncommon to have car owners complain of the tremendous expense of having certain repairs made. The main job of the makers then was to get the cars on the market and the question of accessibility was secondary.

Now that we have 8,000,000 automotive vehicles in the country, and more coming on all the time, things are being shaped a little different and service, instead of secondary, is getting primary consideration on the drawing boards of our factories.

Although there are still some makers whose cars are not as accessible as they might be, the general trend is to make cars so that the vital units can easily be reached for adjustment or replacement. A few years ago it was common to have to remove several units of an engine, rear axle, etc., to get an offending member, all of which meant that the car owner had to pay for a lot of work for which he logically should not be charged. In addition there was the objectionable feature of often having to disturb bearings which were functioning properly.

simply because of the inaccessibility of the part in question.

From the cars exhibited at the New York show it becomes quite an easy matter to observe some of the outstanding service and maintenance features which will make the cars of 1921 easier to keep in repair. While our engines and chassis designs have been cleaned up during the last few years there are numerous additional instances in this year's cars where elimination of unnecessary parts, or a better arrangement of certain members, have made it easier for the repairman.

With few exceptions, the engines in our cars today are easier to get at because the designers seem to have realized the fact that the time element in making a repair is of vital importance not only to the dealer and the service station but to everyone concerned. Perhaps the most noticeable feature in making parts easier to get at is the placement of the spark and throttle levers. On L-head engines this is especially of importance because with a multiplicity of levers obstructing operations on the valve adjusting nuts,

distributor or carburetor, time involved in making adjustments or repairs mounts very rapidly.

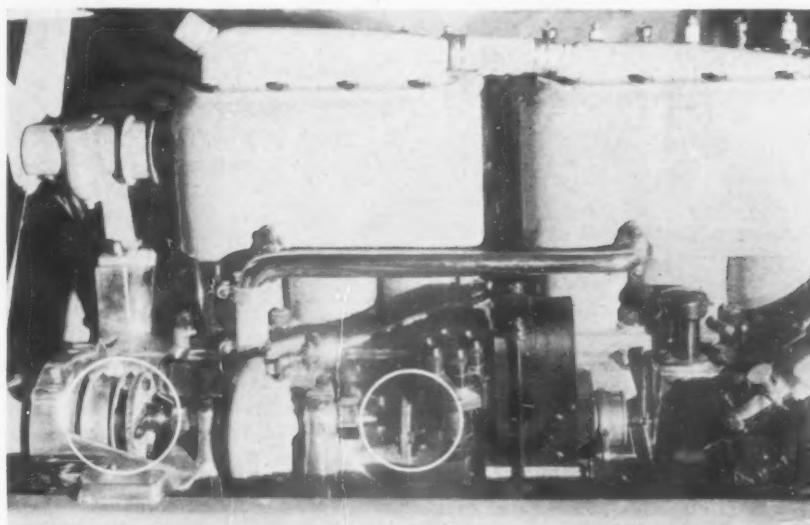
There is a tendency to place the spark and throttle control rods horizontally with the axis of the engine, vertically, or, in some cases, crosswise. Notable examples of this are Buick, Templar, Fergus and Studebaker. It does not take much imagination to see what this means. It means that the mechanic can swing wrenches without interference and does not have to disconnect any of the levers. Interference of parts always has been the chief obstacle in getting certain repair jobs down to a reasonable basis and for which many a service manager has had to do no endless amount of explanation to some irate car owner.

Placing Electrical Equipment

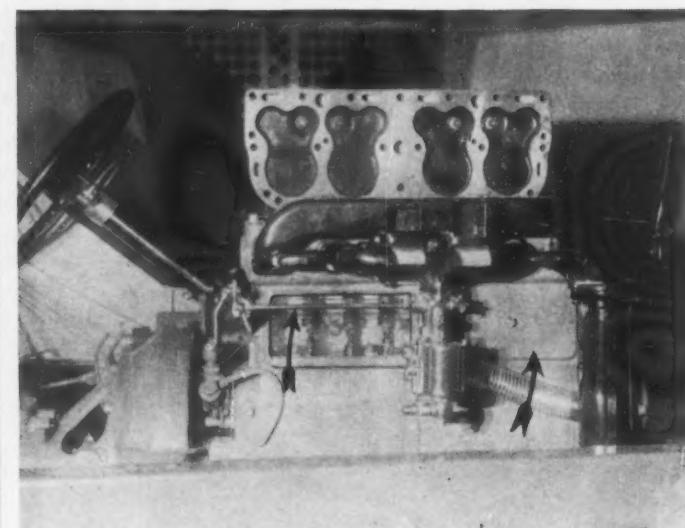
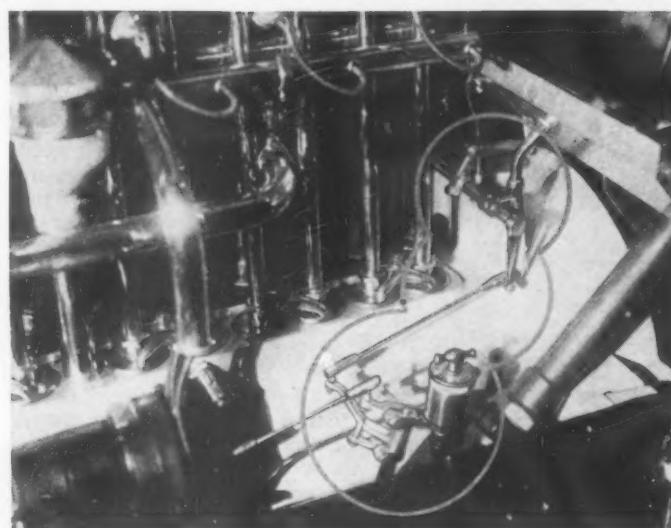
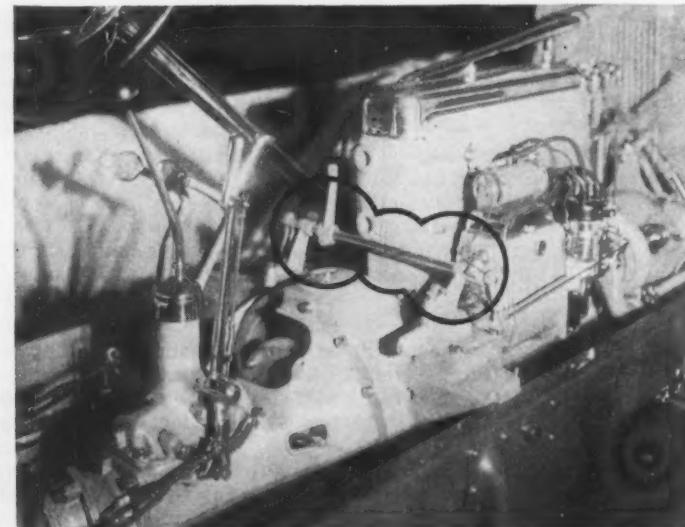
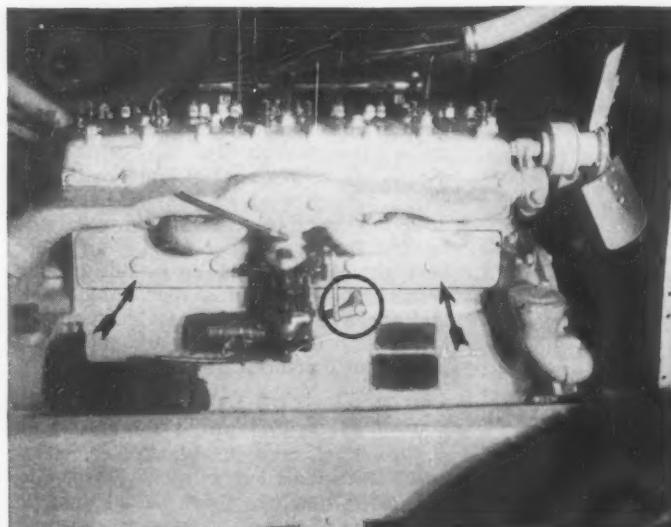
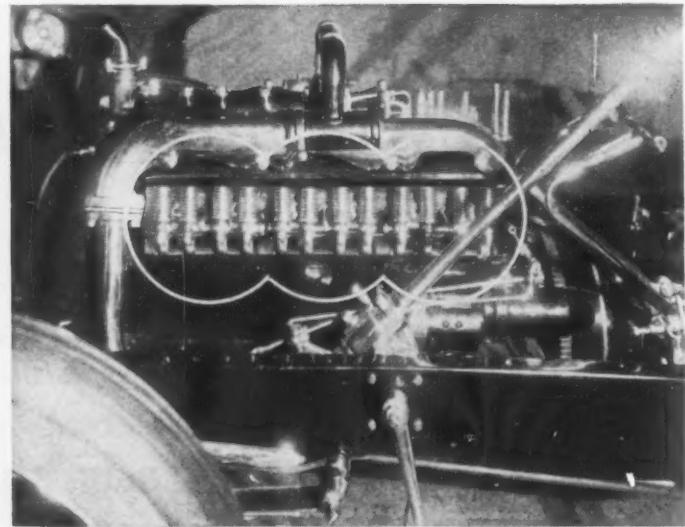
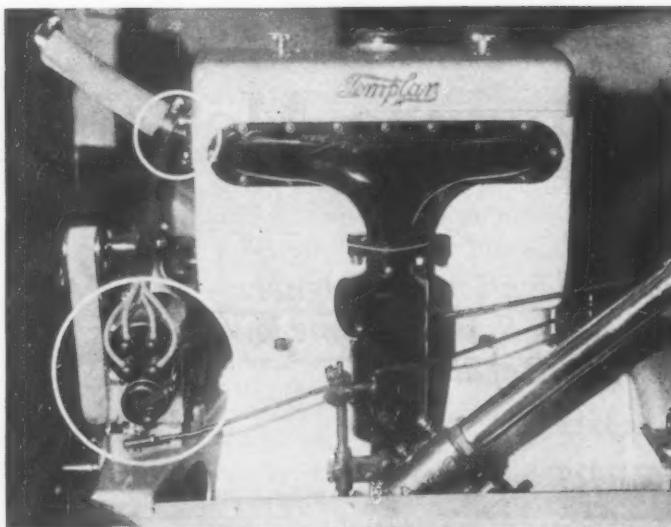
With a cleaning up in the design of engines has come the placing of accessories like distributors, generators, etc., that mean much to those called upon to look after the maintenance of cars. A typical instance is shown in the new Packard Single Six. Here the ignition unit is placed on top of the engine. Also the water pump, fan and thermostat which form a single unit have been placed high on the front of the engine. There are few of the accessories placed on the side of the engine. This is important in engine layouts because with the ever increasing number of accessories on engines their location becomes relatively important. When they are placed on the side of the engine, between the latter and the car frame, they not only make the engine inaccessible but become inaccessible themselves.

Along this line mention might be made in regard to the placement of the steering gear on the frame for ready accessibility. On three cars—the Mercer, DuPont and Fergus—the steering gear is mounted on top instead of on the side of the frame member. This brings the adjustments within easy reach.

Some of our engineers have copied European tendencies in that they have put continuous webs between the crank-case and car frame. This does away with the objectional underpan of sheet steel and besides makes it possible to hang the engine slightly lower in the frame. A further advantage of the continuous web construction is that tools



The location of the fan belt pulley in back of the gear housing means less chance for oil leakage. The circle in the center shows the flexible joint between water pump and magneto making the latter accessible



How Service Has Been Made Easier on 1921 Engines

Upper left hand picture shows the accessible mounting of the magneto on the Templar and the water outlet manifold location on the cylinder block which does not interfere with the removal of the valve cover. Top, right, the accessible position of the valve adjustments on the Studebaker. Center, left, the Davis engine with arrows pointing to valve covers, removal of which gives ready access to the valve adjustments. The circle shows the cross shaft for the throttle control, a practice which is gaining favor. Center, right, spark and throttle control shaft of Buick, which makes for a neat layout of the control rods. Lower, left, control shaft on the Dorris and large grease cup on steering gear housing. Lower, right, the horizontal throttle rod on the Allen which is high enough so that it does not interfere with valve adjustments

or parts will not drop out of sight into the mud and grease which usually goes hand in hand with the old style underpan. In some cars where continuous webs are not fitted the maker has obtained the same results by bolting pieces between the engine and frame.

The adoption of the valve-in-head type of engine by some makers naturally has brought about some problems that had to be met and overcome. One of these problems was that of valve inclosure, particularly in the matter of disposing of the water outlet in the top of the cylinder block. Inasmuch as the problem of valve enclosure is a comparatively new one, it is interesting to note the various ways in which the different engine makers have gone after it.

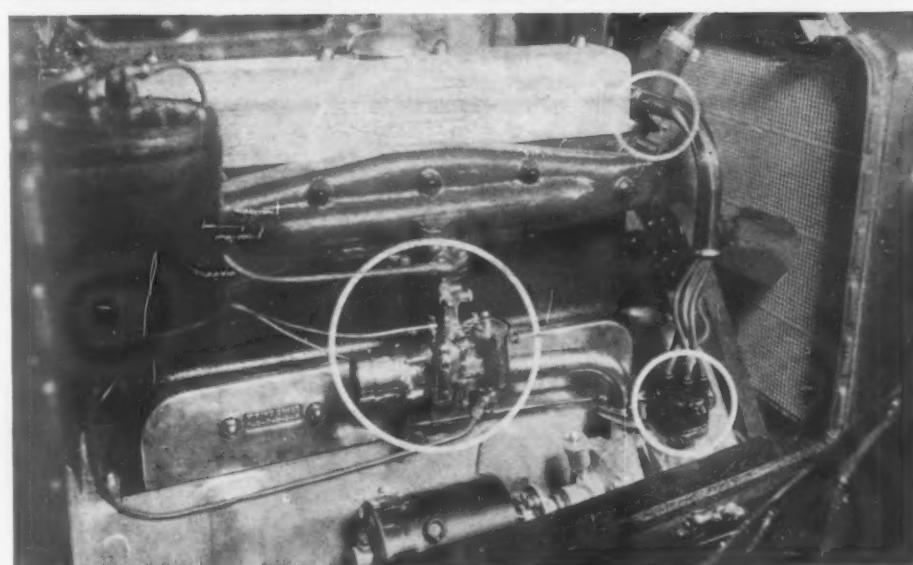
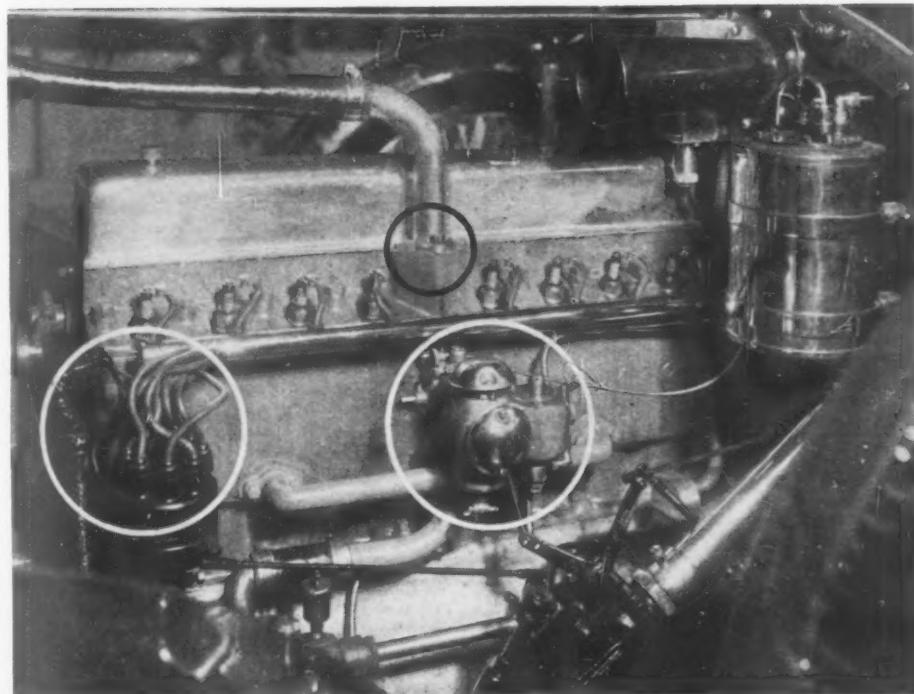
In the Stephens, the valve cover is water-jacketed and the outlet header is cast integral with the cover. This tends to keep the valves and the adjacent parts cool. The Falls engine used in the Grant, Elgin, Maibohm and Velie now has its valves enclosed by a metal cover and in addition the push rods on the left side of the engine have been enclosed. The former position of the water outlet manifold on the cylinder head has not been disturbed. Both the National and Premier engines have neat layouts of their water outlet headers.

Uniform Cooling Action Sought

The bell housing construction is constantly coming into more general use, among those who have adopted it recently being the Pierce-Arrow Motor Car Co. Although the Pierce retains the separate transmission amidships it now has an enclosed flywheel and clutch, and this has eliminated the characteristic Pierce engine suspension by means of two drop forged carriers. At the front, the drop forged carrier is retained but at the rear integral arms extend from the bell housing and rest upon legs riveted to the frame, the holding down bolts passing through the arms and legs being provided with coiled springs under their nuts to provide flexibility.

Some expedients are resorted to in order to get uniform distribution of flow of water and consequently uniform cooling action. In most cases the pump is mounted near the front of the engine, which makes it most convenient to have the water inlet near the front, and the outlet from the cylinder jacket to the radiator also comes most naturally either at the middle of the head or some point forward thereof. Consequently there is danger of sluggish circulation in the rear jackets, and as it is the hottest cylinder that causes trouble from knocking and faulty lubrication it is important to take precautions against this eventuality.

In the Du Pont car in which the pump is located in front of the engine and driven from the forward end of the accessories shaft, the water inlet connection to the cylinder block is made at the front end but a pipe extends through the jacket to the rear and as the outlet is also at the front the water is compelled to flow through the entire length of the jacket. The somewhat similar arrangement on the aluminum engine of the Premier car is well known and is shown



The Service Man Considered in These Designs

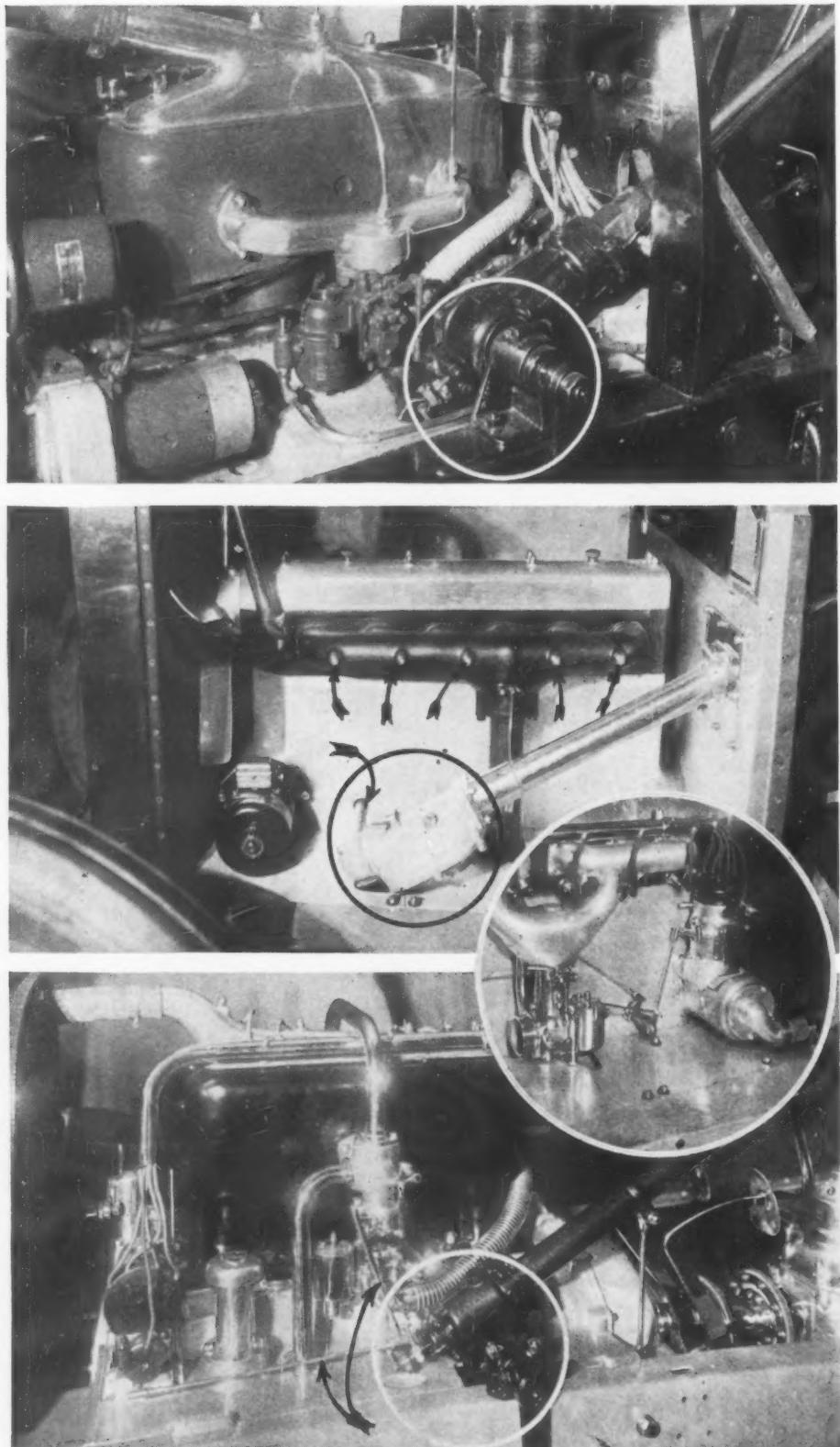
Top, some accessibility features on the new Kenworthy. The distributor and carburetor are easy to get at. Note also the plug location, and, in circle, the water outlet which is not disturbed when removal of the valve cover is necessary.

Below, clean design of the Northway engine

to good advantage in a cut-away model at the Grand Central Palace. On the engine of the six cylinder KisselKar, on the other hand, where the pump is located at the side of the engine forward, the inlet pipe is run along the side of the cylinder block and the water enters the jacket at the rear.

Where the inlet manifolds are jacketed it makes for simplicity and neatness if the inlet to and outlet from the jacket are through ports alongside of the main inlets ports of the manifold. In the new Pierce-Arrow water from the engine cooling system enters the jacket in this way, and in the Lafayette, exhaust gas. In connection with manifolds it seems to

be a good plan to hold them in place by means of stands whose nuts are outside the plane of the manifolds, as such nuts can be screwed in place and removed much more conveniently than nuts passing through legs or ears cast on the manifold and lying close up against the cylinder blocks. Moreover, if the nuts press on clamping pieces or bridges between sections of the inlet and exhaust manifolds, as in the Scripps-Booth (Northway engine) they will not get so hot and are not so apt to rust tight as if bearing directly against a part of the manifold. On the Fergus engine the exhaust manifold is held in place by five studs passing through cast-on bosses the



Accessibility of Steering Gear Improved

Instances where the steering gear has been placed on top of the frame, making it more accessible. Top to bottom, the three views show the installations on the DuPont, Fergus and Mercer. The arrows in the center picture show the accessible nuts on the studs of the manifold. The arrow in the circle shows the cross shaft from steering which goes through the block and communicates with the spark and throttle rods on the other side, shown in the circle. Note the exceptionally short control rods on the Mercer, indicated by arrows.

whole depth of the manifold, this bringing the nuts into accessible positions.

At each show in recent years—and the present one is no exception—there have

been exhibitors who in the course of the year had changed from splash to force feed lubrication. With this change often goes the adoption of oil pressure control

in proportion to throttle opening. This method of lubrication control is in use on the Chalmers and Liberty, the Kissel and Stearns among others. On the Stearns car the linkage from the accelerator pedal and throttle lever rod to the throttle valve and oil pressure relief valve is particularly neat and is shown in the sketch.

Restriction of the outlet passage from the engine space has long been a cause of poor cooling of engines; or perhaps it would be more correct to say, was formerly a frequent cause of poor cooling, because the fault has often been pointed out and has been remedied on most water cooled cars. One of the improvements in the Holmes air cooled car aims at eliminating this fault. This car has a centrifugal type of fan, constituted by the flywheel, and as the outlet from this fan is in a radial direction and the space between it and the mud pan and other parts of the enclosure is restricted the circulation of the air has been greatly hampered. By installing what is called an aeroduct (see sketch) the rate of air circulation at any given speed is said to have been practically doubled. This consists merely of an aluminum casting surrounding the fan flywheel on its circumference in which are formed a series of air passages which gradually change the direction of the air from perpendicular to parallel to the car axis. Holmes has also done away with his rather intricate valve mechanism and now uses a plain tappet and rocker motion.

New Mitchell Feature

A feature of interest from a maintenance standpoint on the Mitchell six cylinder engine, is an eye bolt in the cylinder head casting by which it can be easily removed when necessary. Although this feature is not new with the Mitchell it does not seem to have been copied so far. The nearest approach to it in other engines is in the form of overhanging lugs at the ends of the head casting which afford a grip when the head is to be removed.

The Oldsmobile eight has the generator mounted centrally in front and driven by belt, the fan being mounted on an extension of the armature shaft. This is similar to the construction used on the Nash. Belt drive of the generator was also noticed on one other car where the fan was not combined with the generator. While there is some objection to a now-positive drive of the generator it must be remembered that the power consumption of the latter is much less than that of the average fan. The average generator delivers not over 20 amp. at about 7 volts, which is equal to 140 watts, and at 50 per cent generator efficiency the power which is equal to 140 drive the generator is only slightly more than one-third of a horsepower.

Quite a few designers now place the driving pulley for the fan belt on the accessories drive shaft behind the gear housing. This has the advantage that it eliminates one shaft outlet from the gear housing and one chance for oil leakage.

While the cars for 1921 show no radical changes in frame construction

(Continued on page 28)

Schools and the Automotive Dealer Unite for BETTER MECHANICS

There Exists an Unprecedented Demand for Instruction. Dealers Are Offering Every Help Possible to Teachers

HERE is no longer a shortage of expert mechanics such as existed a few years back on the western coast. From the shops of the public schools, from the private engineering institutions, which have multiplied rapidly in number in recent years, and from the shops maintained by the Knights of Columbus, the Y. M. C. A. and other similar organizations, there is issuing sufficient new mechanics to care for the expanding needs of the automotive trades.

So great is the demand for enrollment in the day and night automobile classes in many Pacific Coast cities, that waiting lists containing as high as 300 names at one school, have had to be established. In this connection, it should be noted that the Knights of Columbus and the Y. M. C. A. are materially helping to meet the unprecedented demand for instruction in automobile repair work. The Knights of Columbus is especially doing yeoman service in Seattle in its automobile classes for returned service men.

Inquiry among the different public and semi-public institutions in Seattle offering automobile repair classes reveals the unstinted encouragement given by automobile dealers and automotive repair men generally to the successful conduct of these classes.

"We have yet to record an instance where we have failed to receive a favorable reception to requests for the loan of cars or pieces of mechanical equipment for study in our shops; to requests to open up establishments at night for the inspection of the classes; or to invitations of dealers to come personally and

Encourage Mechanics to Know "Why"

WHAT kind of mechanics do you employ—"know how" mechanics or "know how—and why" mechanics? If there are just "know how" mechanics on your payroll you will probably find it profitable to encourage them to attend automobile school classes in your city and learn the "why." Read what other dealers are doing to help further this work.

speak before our classes at the school shop," said the superintendent of the mechanical department of the Seattle public school system.

Mr. P. E. Sands, president of the Automobile Chamber of Commerce of Washington state, declares that the schools are performing a remarkable service in raising the standard of efficiency among mechanics and that dealers generally should seize every opportunity to impart their knowledge to school classes or to form committees among themselves to act as an advisory board to the school authorities.

School authorities point out that it is not alone the inexperienced, would-be mechanics who should attend the automobile classes, but mechanics regularly employed as well.

The demand today is for the "know how—and why" mechanics—men who not

only do things with the hands alone but with the hands and mind working together, and it is the school automobile classes that are satisfying this demand. Men who can efficiently do jobs mechanically—in fact, men who have been engaged as mechanics for years—are going back to school to find the "why." They are gaining a wider perspective—looking beyond the mere job in hand, with the result that the new army of mechanics, including a liberal percentage of "rejuvenated" mechanics, are showing a greater plane of efficiency than ever before in the history of the automobile.

Private institutions dedicated to the development of more and better automotive mechanics are rapidly increasing in numbers in the United States. These institutions are doing a yeoman service in raising the efficiency of automobile repair work, turning out trained mechanics thoroughly schooled in the how, the why and the wherefore of all units that go into the make-up of a motor car, truck, tractor or airplane.

The Seattle Engineering School, of Seattle, Wash., recently entered its new \$200,000 home and today it stands as one of the largest practical vocational trade schools in North America. The school building, constructed of brick and concrete, is three stories and basement, and has a student capacity of 850. It is equipped with large class rooms and commodious work shops, and a dormitory to accommodate 300 students, a cafeteria to accommodate 400, together with gymnasium, reception room, reading room, and shower baths.

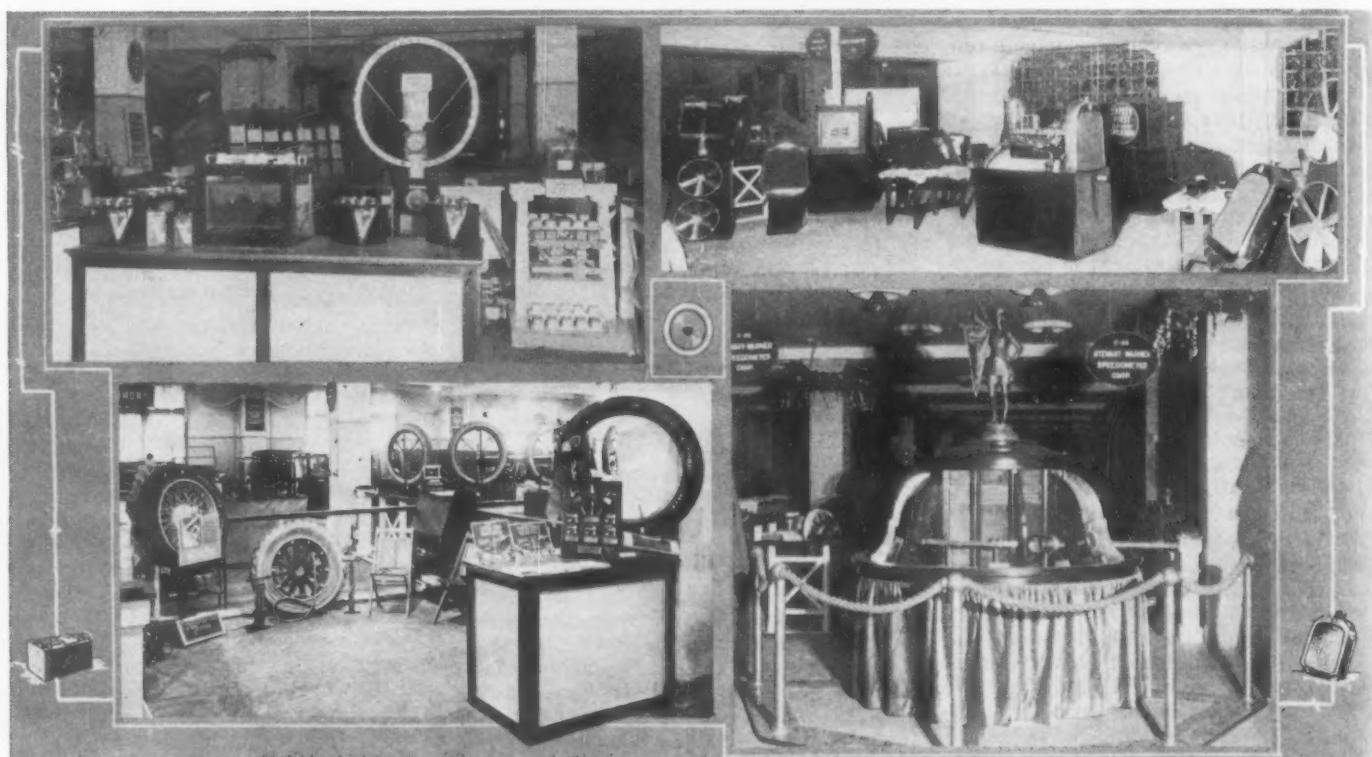
Mechanics Not Content to Merely Know "How"—They Want to Learn "Why"



The school at the right is typical of the large private American institutions to be found in virtually all automotive centers in the United States which are dedicated to the development of more and better automotive mechanics. The picture shows the new home of the Seattle Engineering School with a big garage in connection. At the left is a night class of automotive students receiving instruction at a Seattle high school

GOOD MERCHANDISING MARKS ACCESSORY DISPLAYS

Makers Demonstrate Utility of Products in Many Interesting Ways—Some of the Devices Exhibited Described Here



Some Typical Exhibits at the New York Show

The Witherbee Storage Battery Co. (upper left) carried a magnet energized by a storage battery in its booth. This magnet was capable of bringing a 600-pound load up a distance of 4 inches with a bang. Different in its nature but as interesting was the Stewart-Warner display (lower right) where the products, gold plated for the occasion, reposed in purple velvet compartments.

Folberth Automatic Windshield Cleaner

The cleaner is attached to the top of the windshield frame in front of the driver's seat. A rubber tube runs from the cleaner through the dash, and is connected to the intake manifold by fittings which are furnished. The suction from the engine causes the cleaner to sweep back and forth automatically. Packed in carton, complete and ready for installation. Adie Auto Specialty Co., Distributors, 301 West Fifty-seventh Street, New York City.

Double Disk Steel Wheels

In this wheel, the hub, the rib and two pressed-steel disks, are electrically welded into one piece. They can be mounted on the same type of inner hub assembly as used for wire wheels. Good-

year quick detachable rims for straight sided tires are used. Standard sizes are carried in stock, and prompt delivery can be made on special types. Robinson & Smithers, Inc., 5 Columbus Circle, New York City.

Dura Crank Window Regulator

The handle on this regulator turns a worm which actuates the raising lever. Windows equipped with this regulator are always locked and cannot be moved except by the handle. They can be installed on any car. Specifications necessary in ordering are width between slide channels, length of glass travel and position of handle. The complete assembly consists of twenty-nine parts. Dura Mechanical Hardware Co., Toledo, Ohio.

American Protected Flashlights

Furnished in vulcanized fibre cases, or in nickel finished metal cases. There are no movable parts within the case. There is a little device called a shock absorber, at the base of the lamp to protect it from damage. The switch is of the dual contact type. Batteries to fit these lights are furnished. Mazda bulbs are used. American Carbon & Battery Co., East St. Louis, Ill.

Stokes Rear Axle

In this axle, two leather-faced cone clutches are mounted on the rear wheels. The driving cone is drawn inward by the thread on the inner end of the drive-shaft, and engages with the inside cone when going forward. In reverse, the

driving cone is forced out and engages with the inside cone when going forward. In reverse, the driving cone is forced out and engages with the outside cone. When coasting, neither clutch is engaged so although the wheels are revolving, the drive shafts are not. No differential is used as the clutches take its place. Stokes Engineering Co.

U.S.E. Shock Eliminators

This shock absorber is installed between the car and the frame in place of the shackle. It consists of a metal casing in which are assembled two spiral springs, the upper one taking the load, and the lower the rebound. The bumper is part of the front shock eliminators, and is connected with the load spring to absorb any shocks due to collision. Price, complete set, \$135. U. S. E. Corp., 7 West Sixty-first Street, New York City.



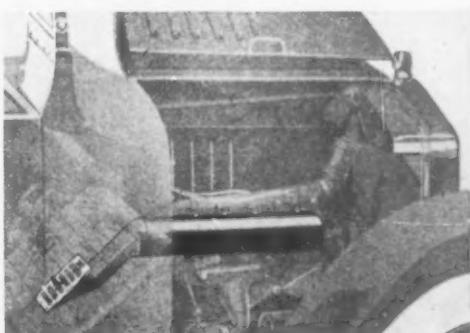
U. S. E. shock eliminators

Warm-a-Ford

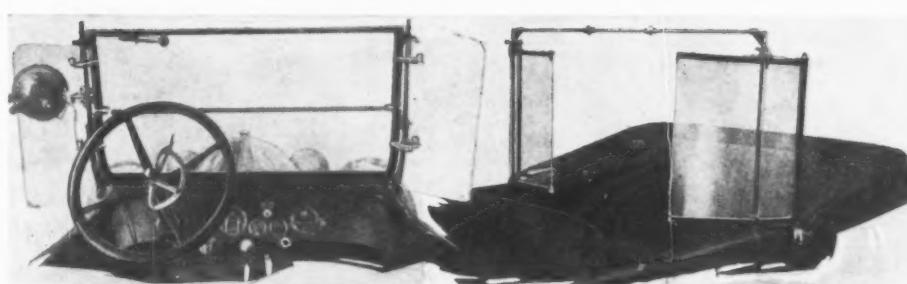
A special heater for the Ford car. It fits over the exhaust manifold. The fan draft passes into the device and is heated by the manifold. The warm air is delivered to the front seat through a register. The register may be closed by means of a foot-operated lever. The entire device is finished in black Japan. Price, \$5. Kokomo Electric Co.

Gemco Tonn-O-Wings

Tonn-O-Wings are designed to shelter the occupants of the rear seat from draft and dust. They do not extend across the back of the front seat. They can be quickly attached and can be adjusted



Warm-a-Ford



Mitchell auxiliary windshields

Gemco Tonn-o-Wings

to any position. The frame is enamelled black with silver fittings. Each wing is made in two sections, the rear panel being stationary and the front adjustable. The latter panel is 12-in. wide on all models, but the rear panel is furnished in 6, 8, 10 and 12-in. widths; all models are 22-in. high. Prices are \$51, \$53, \$57, and \$60, respectively. Gemco Mfg. Co., Milwaukee, Wis.

Mitchell Auxiliary Windshields

These are glass wings which attach to the side of the windshield. The standard fittings are for cars having wing nuts or studs on the windshield standard, and the Eureka fittings are universal. The fittings are made of bronze and are finished in nickel. The glass is held by a goose neck and wedge. Price, standard fittings, \$24.50; Eureka fittings, \$25.50. Mitchell Automotive Co., New York City.

Glar-Stop

Attached to the top of the windshield by means of a clamp, this device is provided with a colored center glass. When not in use, it may be swung up out of the way. It is held in the position it is placed by means of a ratchet. Price, \$3.50. Sedgwick Sales Co., 1409 Sedgwick Avenue, New York City.

Cozine Curtains

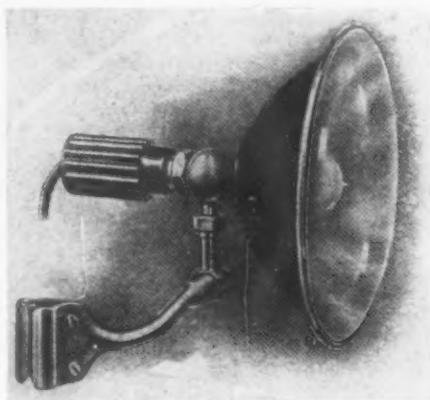
These curtains are operated by an arrangement of small pulleys and elastic cables. Each curtain may be operated independently of the others. The curtains are covered by a head lining in the top which gives them a neat appearance and protects them from dust. The curtains are adaptable to any car. Axton-Cozine Mfg. Co., Detroit, Mich.



Disteel wheels for Fords

Gilfillan Spotlights and Brackets

A line of spotlights and brackets which fit all the standard makes of cars. The Westerner, type SLW, is listed at \$15; the Pathfinder, type SLP, at \$7.50, and the Californian, type SLC, at \$12. A rear sight mirror for use with these spotlights is also manufactured. Price, \$1.60. Ten feet of extension cord for use with these lights is priced at \$2. Superior Lamp Mfg. Co., Distributor, 150 West Fifty-second Street, New York City.



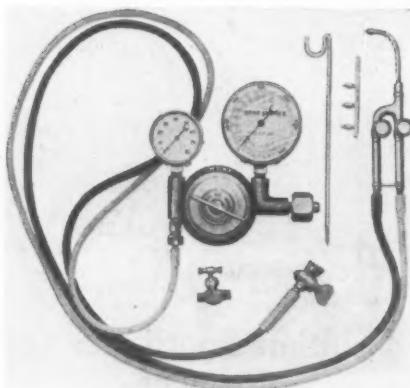
Gilfillan spotlight

Teetsow Ball Bearing

These bearings are of standard dimensions, which make them interchangeable. They are of the radial-thrust, double row type. The races are made of chrome steel, hardened and ground. The balls are guaranteed accurate within 0.0001 in. These bearings are guaranteed against defective workmanship and materials for one year. Teetsow Bearings Co., Inc., 154 Nassau Street, New York City.

Disteel Wheels for Fords

These wheels are of exactly the same construction as former types of Disteel wheels. The complete equipment consists of 5 demountable wheels, 2 front hubs, 2 rear hubs with brake drums, 1 spare wheel carrier bracket, and 1 license bracket. The carrier is attached to the rear of the body by drilling two holes and inserting bolts and nuts furnished with the equipment. Price, \$75. Disteel Wheel Corp., Detroit, Mich.



Hoke Shontz Lead Burning Equipment

The complete equipment includes regulator and gage, high pressure indicating gage, torch with two 6-ft. lengths of hose, four sizes of tips, and bench hook. No water seal is needed with the regulator as it is provided with a safety device. The torch is provided with regulating valves which are operated with the thumb and forefinger, and in this way the flame is under the instant control of the operator. Two or more torches may be used with one regulator. The units forming the outfit may be purchased separately if desired. Price, complete, \$55. H. B. Shontz Co., Inc., 157 West Fifty-fourth Street, New York City.

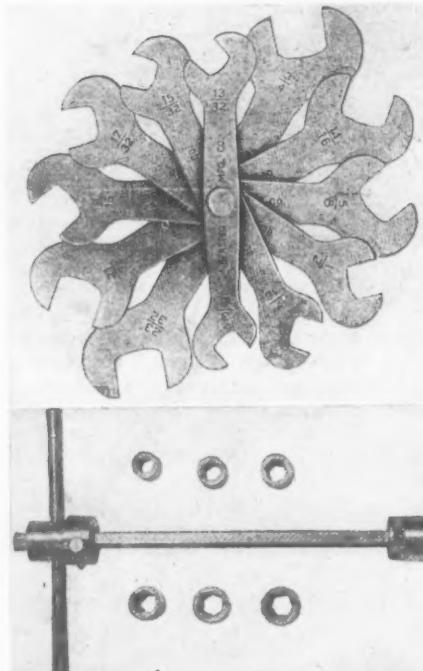


Batometer

A device for indicating low electrolyte level. The filling plugs in the end cells of the battery are replaced by electrodes. If the solution falls below the tip of either or both of the electrodes, the batometer, which is installed on the dash in place of the ammeter, indicates this fact on the lower scale. The upper scale indicates the charge or discharge rate of the battery. Electrodes are furnished to fit all standard makes of batteries. Price with two electrodes, \$12.50—Fairbanks Co., Distributors, Lafayette & Broome Streets, New York City.

Heald Internal Grinder No. 55

A new machine for regrinding 1-, 2-, 4-, and 6-cylinder cast-in-block, engines. The wheel spindle regularly furnished with the machine grinds hole 2- $\frac{1}{8}$ in. in diameter and larger by 11 in. long, and 3 in. diameter and larger by 18 in. long.

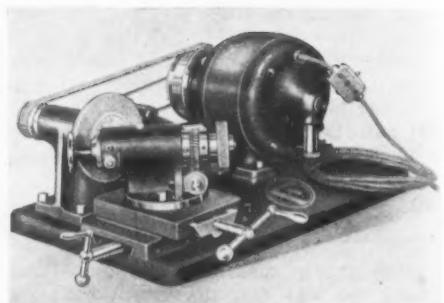


Top—Bersted universal wrench set
Below—Bay state socket wrenches

The horizontal and vertical adjustments have micrometer dials. Equipment includes wheel, spindle and arm, grinding wheels, one mounted diamond, two diamond holders and necessary wrenches. Price, compete with jig, \$2400. Heald Machine Co., Worcester, Mass.

Running-In and Testing Machine

This machine is designed to accommodate all types and sizes of automobile, truck, small marine and airplane engines. It consists of a driving head and a universal engine stand. Adjustments are provided to take care of such operations as assembling, disassembling, grinding in valves, bearing, reaming, burning-in, running-in and testing. The toggle expanding clutch is rated to deliver 75 hp. The pulley is 22 in. in diameter with 10 in. face. Machine may also be used for running in rear axles. Price, \$900. Fairbanks Co., Lafayette & Broome Streets, New York City.



Franklin Portable Repair Shop Unit

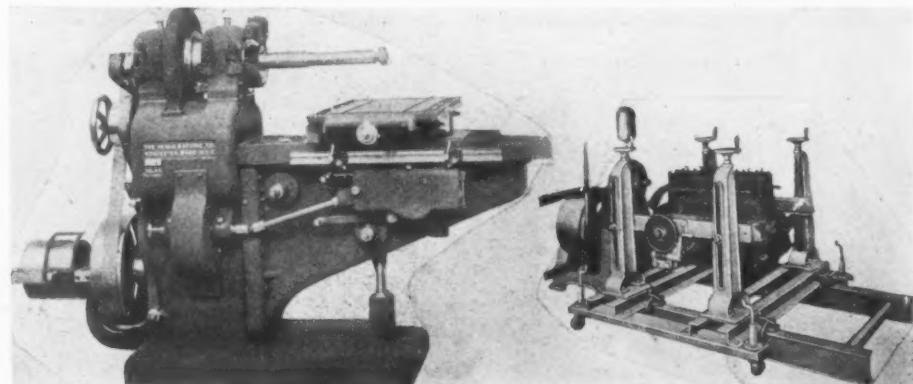
A portable machine tool for grinding and drilling operations. It consists of a flat base on which is mounted a $\frac{1}{4}$ hp. electric motor, a belt driven grinding wheel, a swivel head fitted with draw back chucks, and necessary feed screws. The spindle in the head is driven through a worm and flexible shaft. A flexible shaft attachment is provided for use in inaccessible places. It has a chuck which takes a small drill wire brush, or grinding wheel. Franklin Machine & Tool Co., Springfield, Mass.

Bersted Universal Wrench Set

This set contains six individual wrenches with twelve different size openings. They are made of steel and are case hardened. Each wrench is nickel plated. They may be locked together by means of a bolt passing through the center. Each set is packed in an individual carton. Price \$1.25. Bersted Mfg. Co., 765 Mather Street, Chicago.

Bay State Socket Wrenches

Set No. 21 consists of a wrench which may be used as a reversible ratchet or as a solid wrench, with either T or L handle; with or without extension bar. Included are a removable adapter for use when wrench is applied direct to socket, and seven sockets of the following sizes: $15/32$, $1/8$, $19/32$, $21/32$, $23/32$, $25/32$, and $27/32$ in. Price, in cardboard box, \$4.50; in waterproof bag, \$5. Bay State Pump Co., Boston, Mass.



Left—Heald internal grinder. Right—Fairbanks running-in and testing machine

Penberthy Flometer

An instrument that indicates at all speeds, the hourly rate of gasoline consumption. Used in conjunction with the speedometer, it shows the economy of the car. The dial is finished in black enamel and silver plate. It may be used with either the pressure or vacuum gasoline feed system. Penberthy Injector Co., Detroit, Mich.

Cole Visible Gasoline Gage

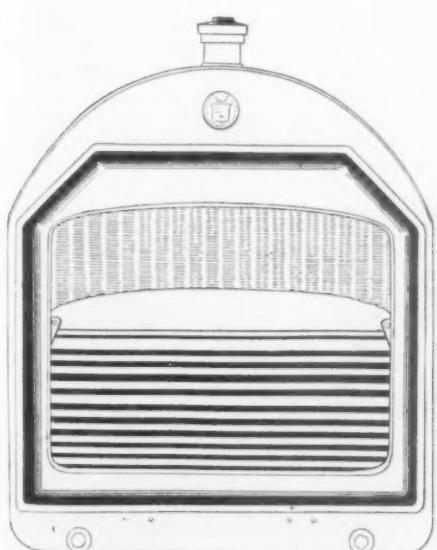
A float operated device for indicating the quantity of gasoline in the tank. The float is connected by means of a wire running in a conduit, to an instrument mounted on the dash. A vertical type of instrument, known as Model A, is provided for use on trucks and Fords. Price, Model A, \$10.50; Model C, \$13. Cole Visible Gas Gage Co., 1364 South Figueroa Street, Los Angeles, Calif.

U. S. E. Shutter

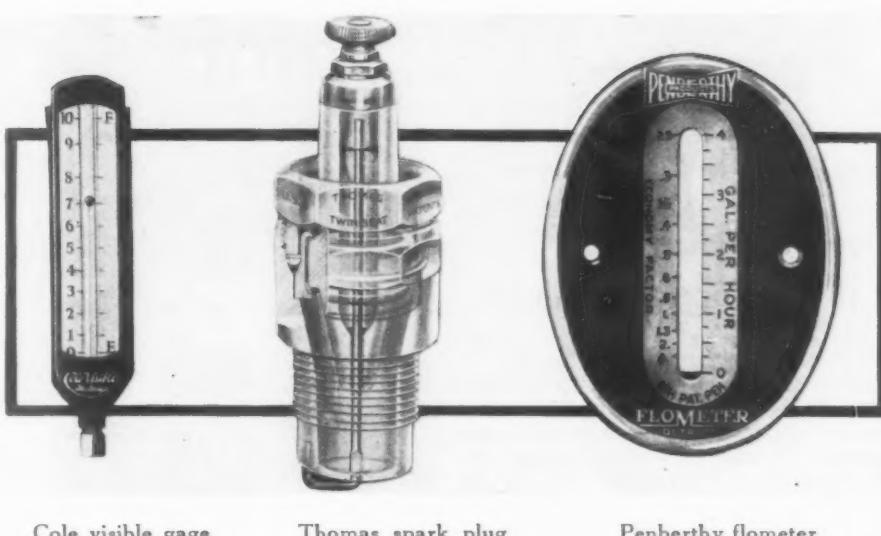
The frame of this shutter is made of pressed steel, and is shaped to conform with the lines of the radiator. It is finished in black enamel. The shutter is made of heavy corrugated rubber. The shutter acts like a curtain and may be raised and lowered from the dash. The dash control bracket is furnished in polished aluminum. Price \$20. U. S. E. Corp., 7 West Sixty-first Street, New York City.

Sectional Radiator for Fords

This radiator is made up of seven integral sections, each of which is independent of the other parts of the radiator. Any section can be removed in five minutes, and it is not necessary to remove radiator from car in changing sections. All parts which come in contact with the cooling water are made of brass. Shultis Automotive Corp., 16 West Sixty-first Street, New York City.



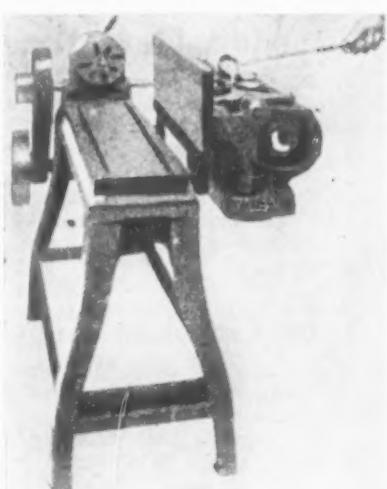
U. S. E. radiator shutter



Cole visible gage

Thomas spark plug

Penberthy flometer



Wilson combination machine

Wilson Combination Machine

This machine takes care of seven standard operations on the Ford engine. It is used as a bench while rebabbing main bearings; a fixture is furnished for this purpose. There is a babbitt boring fixture and a main bearing reamer. The machine may also be used for assembling and disassembling, burning-in and running-in, cylinder reboring, etc. Price \$365. K. R. Wilson, 10 Lock Street, Buffalo, N. Y.

Clark Speed Wagon Axle

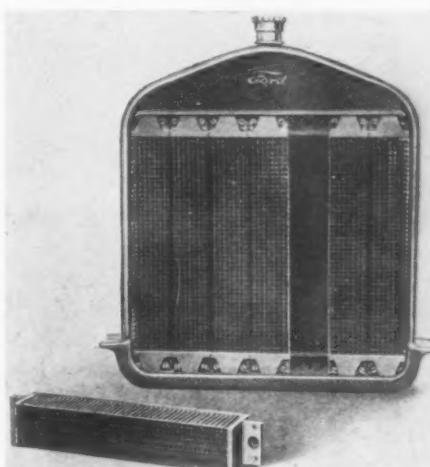
A bevel gear rear axle for use on high speed trucks of one-ton or less capacity. The housing is made of pressed steel, and the differential is supported in a carrier. It can be removed from either the front or the rear of the axle. Two standard gear reductions are provided—5.9 to 1 and 6.2 to 1; spiral bevel gears are used with the larger reduction. The hub is mounted on a splined shaft, and when it is drawn up tightly it clamps the inner race of the wheel bearing. The brakes are of the internal type, 2½ in. wide. The brakes have oilless bushings. Clark Equipment Co., Buchanan, Mich.

Thomas Twin Seat Spark Plug

This plug has a removable center electrode. It consists of three parts—the center electrode which also carries the insulator, the shell body, and the binding nut and gasket. When it is necessary to clean the plug, only the center electrode need be removed. Metallic sealing gaskets are used. The plugs may also be used instead of priming caps. If an insulator is broken, it is only necessary to replace the center electrode assembly. Price, \$1.50. Thomas Spark Plug Co., Roselle Park, N. J.

M. & E. Chassis Oiling System

The oil reservoir is located on the rear of the dash. The oil passes by gravity to the gearset, then through the forward universal joint and down the propeller-shaft by means of a spiral conveyor, to the differential. The oil returns through a flexible tube, which passes through the exhaust pipe where the oil is heated, to the pump which returns it to the oil reservoir after it passes through the oil gage on the dash. The system is said to be readily applicable to any car. Merchants & Evans Co., 2035 Washington Avenue, Philadelphia.



Sectional radiator



J. H. Tonneau Shield

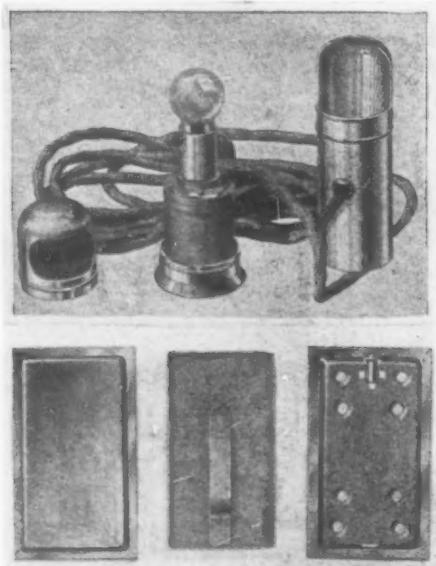
The shield is attached to the body irons which extend under the upholstery at the back of the front seat. Its position can be adjusted by moving it either back or forward on the extension arms provided for the purpose. The position of the wings is also adjustable. A removable, water-proof apron hangs from the bottom of the shield. Prices, \$70 to \$135, depending on type and size. Tonneau Shield Co., 1777 Broadway, New York City.

Accesso License Holder

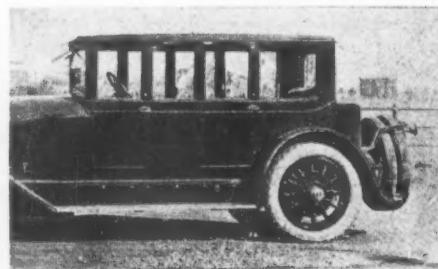
This device provides a place for all papers pertaining to car or driver. It is made of brass with either nickel or gun metal finish. The cover is held securely to the base by a patented fastener. Dimensions $2\frac{1}{2}$ by $3\frac{1}{2}$ by $\frac{1}{2}$ in. Price, \$1. Accesso Mfg. Co., 99 State Street, Boston, Mass.

Accesso Magnetic Lamp

A trouble lamp with a magnetic base so that it can be attached to any steel or iron part of the car. The current from the battery, in addition to lighting the bulb, also magnetizes the base. The complete outfit consists of magnetic coil, base, lamp socket, 4 c. p. bulb, nickel plated brass tube and hood, cord and plug. Price, \$5. Accesso Mfg. Co., 99 State Street, Boston, Mass.



Top—Accesso magnetic lamp
Lower—Accesso license holder



Sargent and Ham top



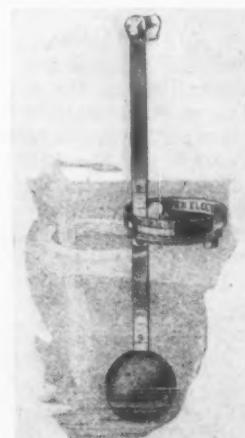
Schrader valve repair tool

Sargent & Ham Tops

These are permanent or demountable tops designed for installation on open car bodies. The workmanship and materials are said to be of the very finest grade. All tops are warranted not to rattle. The illustration shows a four-passenger Locomobile converted into a sedan. Sargent & Ham Co., 28 Scotia Street, Boston.

Apex Gasoline Gage

This is a gasoline gage for Ford and Chevrolet cars. It consists of a cap, which replaces the standard cap, and the gage. The gage is float operated, and the indicator, which is attached to the float, is made of spring steel, with the graduations etched on it. Price, \$1. Apex Electric Mfg. Co., 280 Broadway, New York City.



Apex gasoline gage

Atlas Hydraulic Jack

This jack is built entirely of steel and is furnished in $1\frac{1}{2}$ and $7\frac{1}{2}$ -ton sizes. The liquid used is a light oil, and the cylinder is designed so that it can be easily refilled. Prices are \$7.50 and \$15 respectively. Sunderman Corp., Newburgh, N. Y.

Parker Aluminum Disk Wheels

Combined in one aluminum casting are a disk, ten reinforcing ribs, and the hub. The rim is made of a single piece of steel, having a diagonal transverse split to facilitate application of the tire. Half the circumference of the rim is supported directly on the edge of the wheel, and the other half on four toggle clamps, the wheel being cut away sufficiently on this side to allow easy operation in mounting the rim. These wheels are used on the Franklin. Parker Wheel Co., Cleveland, O.

Cole Cowl Relite

A small, mirror reflector which is attached to the side of any instrument on the dash. When installed it is so adjusted that it reflects the light from the dash lamp onto the dial of the instrument. The reflector is attached to the base by a ball and socket joint which makes it adjustable to any position. Price, \$1. Cole Visible Gage Co., 1364 South Figueroa Street, Los Angeles, Calif.

Schrader Valve Repair Tool

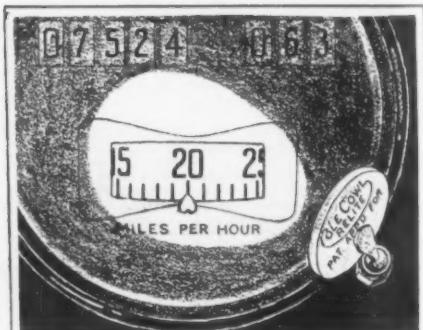
A universal valve tool for repairing damage to cap washer seat at the mouth of the valve stem, the outside valve cap thread or the inside thread in the mouth of the valve stem. It may also be used for removing or inserting valve inside, and for deflating tubes. Price 35 cents. A. Schrader's Sons Inc., Brooklyn, N. Y.

Peerless Wheel Disks for Fords

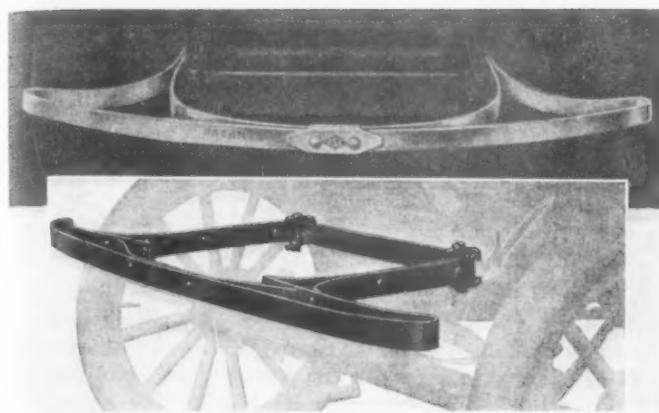
These disks are stamped from 20 gage steel, finished in black. They fit over the hub cap on the outside and are bolted with four bolts to the felloe of the regular wood wheel, or demountable wheel. Packed in cartons, in sets of four, twelve cartons to a crate. Price, per set, \$10. Corcoran Mfg. Co., Cincinnati, O.

Reflectoscope

A rear vision mirror which is furnished in a number of different models for use on open cars, enclosed cars and trucks. A variety of brackets are provided. Prices range up to \$6. Lawson Auto Specialty Co., 47 Bergen Street, Philadelphia, Pa.



Cole cowl relite



U. S. E. Spring Bumper

Various models of this bumper have been designed for attachment to the following cars: Buick, Cadillac, Dodge, Jordan, LaFayette, Locomobile, Mercer, Rolls-Royce, Studebaker, Packard, Paige, and cars equipped with Westinghouse shock absorbers. Prices, for heavy cars, nickel finish, \$16.50; black enamel, \$15.50; medium weight cars, nickel finish, \$14.; black enamel, \$13. U. S. E. Corp., 7 West Sixty-first Street, New York City.

Marquette Luggage Carrier

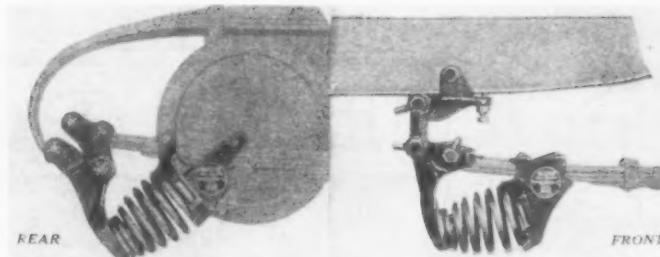
This carrier fits any car, and is attached without any damage to the running board. When not in use it folds down flat on the running board. Brown web straps, 60-in. long are provided to hold the luggage securely in place. These straps are detachable. The carrier is made of steel and is finished in black enamel. Price, \$6. Marquette Mfg. Co., St. Paul, Minn.

Green Hand Safety Signal

The front signal goes on the license plate bar, and the rear on the tail light bracket. Current is supplied by the lighting system on the car, and the signal is operated from a switch on the steering column. Throwing the switch to the left, illuminates a green hand pointing left, and the opposite for right. Throwing the switch back lights both



Marquette luggage carrier



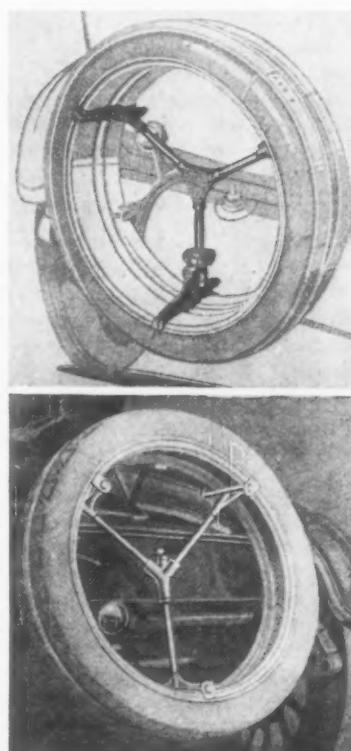
Above — Hassler shock absorber

Left — U. S. E. spring bumper and Taylor bumper

hands indicating a stop. Complete set includes front and rear signal, tail light, switch and cables. Green Hand Safety Signal Co., 47 West Thirty-fourth Street, New York City.

Which Way Advisor Signal

On the dash or instrument board, there is a quadrant which is divided into notched sections, each marked to correspond with the reading on the signal. The lever on the quadrant is connected with the signal by means of a wire enclosed in a conduit. This wire operates the device. For emergency use, an oil lamp is provided to replace the electric bulb. The signal shows back, slow, stop, left and right. The signal proper is mounted on the rear license plate bracket. Which-Way Advisor Signal Co., 797 Bailey Avenue, Buffalo, N. Y.



Top—Trex twinlock tire carrier
Lower—Letmont tire carrier

Hassler Shock Absorber for Dodge

All the essential features of the Hassler design are incorporated in this new appliance. These shock absorbers can be applied without changing any part of the car or altering the spring construction. Price, \$35 per set. Robert H. Hassler, Inc., Indianapolis, Ind.

Taylor Bumper

This is a spring bumper for use on the Ford car. It is used on both the front and rear ends. U-bolts, which pass around the fender iron, are used to attach it to the car. It is furnished with nickel-plated front bar. Franklin Brass Mfg. Co., 1710 Fairmount Avenue, Philadelphia, Pa.

Letmont Tire Carrier

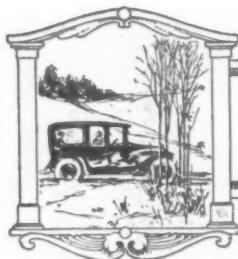
A spare tire carrier that attaches to the felloe band on the rear of the car. The only tool needed for installation is a wrench. It fits any size rim carrier from 30 by 3½ in. to 37 by 5 in. Price, \$9. Letmont Co., Inc., Brooklyn, N. Y.

Trex Twinlock Tire Carrier

A double tire carrier approved by the Underwriters Laboratories. It is easily installed on the spare rim on the rear of the car. It is shipped dismantled and neatly packed in a compact container. It may be used on any car having a circular tire carrier. Price, \$16.50; west of Rockies, \$17.50. Trexler Co., 1418 Walnut Street, Philadelphia, Pa.



Top—Which way signal
Lower—Green hand signal



EDITORIAL



THE YEAR FOR THE SERVICE MAN

that which was not designed as accessible as it might have been. The reward for our efforts is now being realized. The factory service men are beginning to talk of service in a different way. It is being realized that the man close to the solution of the accessibility problem is the service manager, who through his association with the dealers is best able to learn of the dealer's service problems, which, when resolved to the last fundamental factors, reveal that the cost of service is the big "kick" of the owner. The question of removing the cause for dispute by the owner then becomes a problem of reducing the cost of service, and it appears that the easiest method to attain this end is to make it possible for the mechanic to more easily get at the various parts of the car.

Any service bill if carefully analyzed will show that the greater portion of its amount is most generally, though not invariably, due to labor cost. The getting at of some little insignificant part is often done at a labor cost many times in excess of the cost of the part, which might all be remedied by greater accessibility, which would result in a simplification of the service problem and would mean greater satisfaction to the owner, all of which would result in a larger volume of sales. There is no question but that the day will come when cars will be bought on the feature of accessibility alone. Already, the owner is partly educated to the importance of the problem, and he is demanding certain things from the service department when he buys.

Our cry for better accessibility has been taken up by the engineering bodies, and the subject has assumed such importance that it now commands the attention of these learned men, so much that they propose to present a number of papers on the subject.

From all indications 1921 is going to be the year when the service men, those to whom we must look largely to keep our vast amount of automotive apparatus properly maintained are coming into their own.

The agitation directed toward better service methods through various mediums the first year or so has had a far reaching effect on the makers of automotive apparatus. The makers no longer sit back and let the service station worry out their problems alone. The factory service manager instead of being a distributor of parts only as was the custom a short time ago now must study the product of his factory and evolve methods that will insure that product functioning as the engineers and designers want it to function.

DURING the year just closed Motor Age has made an incessant plea for accessibility. It has been our earnest endeavor to offer constructive criticism rather than to sweepingly condemn

It is gratifying to note the way in which the N. A. C. C. through its service committee is linking the efforts of the factory service manager with those of the local service managers or executives. A wonderful work has been done by the various service associations, of which there now are a dozen or so. The makers are doing a wonderful work in promoting meetings at the factory to discuss service questions. The industry at large is seeing the light of service and service instead of being incidental to the sale of a car, truck or tractor is and will become a major factor.



The EXCLUSIVE SERVICE STATION

At the present time there is decided tendency to advocate the exclusive service station or the one that services but one or two makes of cars. This seems to be the ideal

as there is no question but what the men who are familiar with one make of car can do a more efficient job in less time than the men who are not acquainted with the car. In many cases it is necessary to consult the factory engineers before a job can be started.

Now, the question arises, is it advisable to accept a job which your men know nothing about when there is an authorized service station that can handle the work? If the work is accepted in the shop and the service rendered is not satisfactory to the customer, the result is a dissatisfied owner and, of course, a mighty poor advertisement. If the car doesn't work right the owner is not only disgusted with the service station but also begins to think that his car is no good. Consequently the reflection is detrimental to the car manufacturer as well. Why not have a gentlemen's agreement among dealers so that if a car which is being sold and serviced by some other dealer, comes for work other than that which is common to all makes of cars it will be turned over to the shop that is servicing the car.

The acceptance of work with a promise to render certain service will cut into the business of some other dealer and in nine cases out of ten will be detrimental to your organization. Factories co-operate very closely with their service stations throughout the country for the purpose of giving the motoring public the kind of service they are entitled to.

If the exclusive service station is to be a big success it will be necessary to educate the car owner to take his car to the proper place. If this subject can be viewed broadly by service station men and they will enter into some gentlemen's agreement, it will increase the efficiency of service and will be mutually beneficial to all.

More Detroit Plants Re-open

Dodge Reported to Be Planning Resumption in February and Ford About Middle of Next Month—Factories Now Producing Increase Schedules

DETROIT, Jan. 14—While Detroit manufacturers in most instances are attending the New York Show with the officials of merchandising departments, production ends in practically all factories are functioning. The question of Dodge and Ford reopening still is a matter of conjecture. Unofficial reports from the Dodge factory are to the effect that the big plant will swing into production soon after the Chicago Show which means early in February. No one at the Ford plant would offer any information regarding resumption of operations, though unofficially it was said the statement made last week that the plant would not open before Feb. 15, if then, stands.

Studebaker opened its second unit in Detroit Monday simultaneously with the opening of the factory at South Bend. With full resumption today Studebaker starts a schedule of 90 cars in South Bend and Detroit.

Paige, which began taking on men last week preparatory to getting into production, this week has between 800 and 1000 men working with a production schedule of 25 cars a day. Orders on the books and reports from dealers according to production officials justify announcement of a schedule increase of 10 cars a day next week, with a complete increase in working force and two weeks from today the schedule will be increased to 45 a day.

Liberty to Produce Again

Liberty reports splendid information from the dealers' field in the last two weeks, and officials at the plant feel confident that the production schedule will be increased steadily until late spring when it is believed the factory will be on a basis of pre-war normal conditions. Liberty, while the plant has not been down completely, practically has been producing no cars for sometime, and the plant's resumption next Monday will permit of increased operations by the Motor Corp., Timken-Detroit Axle Co., the Michigan Stamping and Tool Co., and other parts makers affected by the Liberty recession.

Scripps-Booth is building closed cars chiefly on a schedule of about 20 percent of the normal conditions or approximately 250 cars a month. This schedule will be increased to 25 percent later this month, and by Feb. 1 it is hoped to have the factory running on a 50 percent basis with a full production schedule March 1. Scripps dealers, according to President Sarver, feel that the bottom

has been reached and they are now moving upward with prospects for gradual improvement in demand. The actual orders on hand and the reports on prospects from dealers are the basis on which the present production schedules have been outlined, and orders to parts makers in line with the schedules fixed have been sent out.

Both Maxwell and Chalmers plants began building cars Monday on a schedule of 25 of each type of car in each plant daily. It is the plan of the officials to increase this schedule beginning Feb. 1.

Hupp Motor Car Corp., which has been on a schedule of 35 cars a day since Dec. 1, now is building 50 cars with a slight increase in the working force, and will continue that schedule throughout this month.

Cadillac Factory Opened

Cadillac swung into production Monday, but no information could be secured as to the production or the number of men employed. Prior to the shut down for the holidays, Cadillac was building on a schedule of around 2,000 cars a month with a force of more than 2,000. It is known, however, that Cadillac had a large surplus and unofficially it is stated production will be held down to about 25 cars a day for the time being.

Oakland Motor Car Co., which had planned to reach a production of 100 cars a day still is behind that schedule according to W. H. Maston, assistant general manager, who declined to say exactly what the daily output is. He intimated, however, it was around 75 cars a day and said the factory was employing about one-third of the regular working force.

Olds Motor Works is turning out 35 cars a day of the new Four, five more than the schedule set at the beginning of the year.

Packard still is operating about 50 percent of its force with a production schedule around 25 daily, chiefly the new single Six.

Buick resumed production Monday and will build about 250 cars daily until the demand justifies an increase in the schedule.

Chevrolet, which resumed production last week, now is operating on a schedule of 100 a day.

Lincoln Motor Co. is operating on a schedule of 10 a day with a working force of about 250. Lincoln has not been down, though for some time they were producing practically no cars, the few

men working employed in the parts department. The present production schedule was entered upon last week and will be maintained indefinitely until the increased demand permits an increase.

Next Few Weeks Likely to Prove Critical in Industry

Bank Loans and Bills to Merchandise Creditors Face Manufacturers—Disposition to Help

NEW YORK, Jan. 17—Notwithstanding the easing of credit and the improvement in the general situation, the next few weeks are likely to prove the most critical encountered by manufacturers in the automotive industry since the post war readjustment began. This is due to the fact that nearly all companies have had coming due since the first of the year, large bank loans and bills to merchandise creditors.

Most companies are short of cash and as a consequence more than one large corporation has found it necessary to ask its creditors for an extension of time. This condition is almost universal and is not by any means confined to the automotive industry. As a matter of fact some other lines are in much worse plight.

Bankers Willing to Aid

Banks generally have assumed a constructive attitude and are willing to do anything within reason to keep the companies to which they have made loans moving along as going concerns rather than take action which might precipitate receiverships with a consequent shrinkage in assets. It is realized that few companies are in a position to pay all their obligations at this time. A similar stand is taken in most cases by large merchandise creditors.

Manufacturers and banks are a unit in feeling that no stigma attaches at this time to requests for extension of time. Almost everyone is in the same boat. For that reason, less significance than usual should be attached to meetings of creditors. In most cases they are being called by the companies themselves for the protection of creditors and in the hope that some amicable plan can be agreed upon to carry them through the crisis.

All Sales in Mexico Made for Cash, Sales Manager Reports

Accessories Vital Part of Automobile Business There—Fords In Great Demand

SAN ANTONIO, Tex., Jan. 15—According to Ralph Trejo, general sales manager for the Triangle Sales Co., who has just arrived here from a six weeks' sales trip through Mexico, business conditions in that country have been especially good recently, so far as selling automobiles and accessories are concerned.

Arthur Robertson, who is vice president and general manager of the Mayfield Auto Co., distributors of Fords in the Republic of Mexico, and who is a brother-in-law of the Egli Brothers, who comprise the Triangle Sales company, declared that various lines of business have increased their sales from 50 to 300 per cent during the past 90 days, including Fords in the latter class. Indeed, the Fords are sold just as rapidly as they can be assembled in the big City of Mexico plant, and because of the cheaper labor attainable, sell for less money than they are selling in the United States today.

"Automobile Row in the City of Mexico is a most interesting highway," continued Mr. Trejo. "All sales are for cash, and almost all is gold, very little silver being in circulation, and no currency. The accessories flank the automobile shops, proper, and are a vital part of the business. French and English cars, in very high-priced models, are sharp competitors with American-made cars, but in the medium-priced and cheap cars, the American has practically no competition.

"Gasoline is selling for 23 cents a litre, and there are four and a half litres to the gallon. Notwithstanding this fact, it is possible to hire a car for 4 pesos (\$2) an hour, in the higher class service car attainable, while most any sort of four-cylinder machine that you want is available at \$1.25 per hour.

"General business conditions are not as booming as they were some little time ago, owing to the fact that the decline of prices has just now begun to reach that country; but in spite of this fact, everything is most encouraging and every manner of business is looking up, and the new spirit of the entire country is a happy thing to see."

Richard Egli, general manager of the firm, will make the trip to the City of Mexico, probably within 30 days, for the purpose of establishing a service station there, according to factory plans.

ARROW PUMP ORGANIZED

Detroit, Jan. 14—The Arrow Pump Co. has been organized by F. M. Cobb, for several years president and general manager of the Fulflo Pump Co.; R. G. Donley, for the past few years with the Detroit Commercial Realty Co.; H. E.

Henry, sales manager and assistant treasurer of the Michigan Machine Co., and W. B. Sparks and R. B. Huyett, formerly treasurer and chief engineer respectively of the Fulflo company. The company is manufacturing a full line of small pumps to be sold under the trade name of "Arrow." Capacities at first will range from four quarts to twenty-five gallons per minute. The line will later be increased to take in larger sizes. All pumps will be supplied with patented gland which includes

Is Ford Planning Stock Issue to Public?

NEW YORK, Jan. 14—Financial circles in this city have been deeply interested this week in circumstantial reports that Henry Ford proposes to offer to the public in the near future an issue of \$100,000,000 participating 8 per cent preferred stock of the Ford Motor Co. The stock would participate in the earnings of the company up to 12 per cent, it is stated, but would have no voting power.

Ford does not intend to offer any part of the stock to the banks, it is said, but intends to sell all of it to the public. He is reported to be confident that he would have no difficulty in disposing of it to the public and that the offering would be over-subscribed quickly.

Although official confirmation of the report is lacking, bankers here are inclined to believe it is true.

ring oiling automatic lubricating system. The larger ones will be supplied with ball bearings for both annular and thrust loads.

DODGE ESTATE, \$50,000,000

Detroit, Jan. 14—The will of Horace E. Dodge leaves practically the entire estate, estimated at \$50,000,000, to Mrs. Dodge and Howard B. Bloomer, chairman of the board of the Dodge Bros. Motor Car Co., as trustees. The widow will receive the income until her death, when the estate will be divided equally between the two children, Horace E. Dodge and Mrs. Delphine Dodge Cromwell, provided they are 30 years old. If they have not reached that age the property will be held in trust until they are thirty.

Maxwell-Chalmers Plan for Consolidation Is Operative

Outstanding Obligations Liquidated Largely Through Sale of Cars in Dealers' Hands

NEW YORK, Jan. 14—After weary months of conference and compromise the reorganization plan which will bring about a formal consolidation of the Maxwell Motor Car Co. and the Chalmers Motor Corp., was declared operative Tuesday, by the managing and reorganization committee headed by Walter T. Chrysler and J. R. Harbeck. More than 37 per cent of the outstanding stock of the two companies have been deposited under the plan, but the committee is extending until Feb. 1 the time under which deposits of stock and unsecured claims can be made without penalty. The following statement on the financial status of the new organization was made by Mr. Harbeck:

Finances in Good Shape

"The new company is now placed in an extremely fortunate position to face the conditions confronting the automobile industry. The net outstanding obligations of the Maxwell and Chalmers companies have been reduced, through liquidation, by approximately \$11,000,000. This liquidation has been largely through the sale of cars in dealers' hands, resulting in a reduction of the companies' obligations arising from the discounting of dealers' notes, paper, etc. The merchandise and bank creditors are to be amply protected through substantial cash payments and the funding of the balance of the obligations upon a one, two and three year serial note basis.

"The reorganized company may be regarded as being upon a sound basis for profitable operation on the basis of reduced sale prices. During the reorganization period points of contact with the public have been more than doubled through establishment of additional selling agencies and branches, and the sales prospects are now considered to be as good as those of any company in the industry.

"An analysis of the balance sheet, after excluding good will and allowing \$100 per share for the A shares, which are preference shares, shows a book value for the B stock of approximately \$30 per share."

CALIFORNIA HAS 534,814 CARS

Sacramento, Jan. 14—Although the registration of motor vehicles in California for the fiscal year does not close until Feb. 1, the registration for 1920 is given by Superintendent Charles J. Chenu of the Motor Vehicle Department as 588,939. This includes all motored vehicles, excepting tractors, which are not registered in California. In the registration are included 534,814 passenger cars and 34,078 trucks.



They Are Here to Better Service

The second annual convention of Automotive Service Associations vied in interest with the New York show in bringing together service executives from many important cities. Here they are, gathered at dinner at the Hotel Commodore shortly before the speechmaking started.

Service Executives Hear Plea Against "Gyp" Repair Shops

Representatives of Associations Throughout Country Gather at Second Annual Convention

NEW YORK, Jan. 14—More than 100 service executives representing automotive institutions from many of the larger centers of the country attended the second annual convention of Automotive Service Associations at the Hotel Commodore. The entire session was given over to the perfecting of plans to co-ordinate the efforts of the various associations of which there are eleven at the present time. A delegate from all but one or two of these associations read reports of the year's progress.

Preceding the meeting H. R. Cobleigh, secretary of the service committee of the National Automobile Chamber of Commerce, delivered an address of welcome. Mr. Cobleigh made a strong plea for the elimination of the "gyp" repair shop. He also touched on the early struggle of some of the associations, of the interest of the manufacturers in the movement and of the formation of the service committee, which among other things was formed to get a point of contact between the factory service managers and the local service managers. He predicted great strides during the coming year.

Activity reports were read by representatives of the New York, Brooklyn, Newark, Baltimore, Western Massachusetts and the Syracuse automotive service associations. In addition representatives of the Automotive Electric Service Association told of the work this organization had accomplished.

The afternoon was given over to the reading of various technical papers. Alfred Reeves, general manager of the N. A. C. C., addressed the gathering and stated that from the manufacturer's viewpoint, this was to be the year for

the service manager, because of the earnest effort being put forth by most of the factories to get their service work on a proper working basis that will work out well for manufacturer, dealer and customer alike.

Ray W. Sherman, executive editor of The Class Journal Co., addressed the meeting on the subject, "Selling Yourself." Mr. Sherman pointed out the fact that the matter of selling service was largely psychological. He stated that

David Beecroft Heads Society of Automotive Engineers

NEW YORK, Jan. 14—David Beecroft, directing editor of The Class Journal Company, became president of the Society of Automotive Engineers at its annual banquet here last night. Mr. Beecroft has been a member of the society since 1911 and has served on the council for two years. During that time he was a member of the meetings committee and last year acted as chairman.

Mr. Beecroft became assistant editor of Motor Age in 1905 and assumed the duties of editor of that paper when it was bought in 1911 by The Class Journal Company. In 1912 he became directing editor for the group of business papers including Automotive Industries, Motor World, Motor Age, Commercial Vehicle, El Automovil Americano, and Distribution and Warehousing.

one of the most important things for the service man to bear in mind was the fact that he was part of an organization and that a large part of the service manager's job consisted of selling himself to the organization and fitting himself into the general order of things.

Better Class of Mechanics Aim of New Orleans Stations

Employers Believe Greater Efficiency Can Be Gained Through Reducing Numbers

NEW ORLEANS, Jan. 15—Some slight improvement is noted in the demand for passenger cars in the period between Jan. 1 and Jan. 15. The demand for trucks remains steady, about where it was in December, 1920, while tractor sales are gaining. The majority of the passenger car dealers are working harder than they ever have worked before, and are exacting more work from their salesmen.

While the dealers have been for some time weeding out salesmen who did not get results, the operators of garages and service stations are just now beginning to talk of reductions. These reductions apparently will take the form of cuts in the number of men employed rather than in wages. The service and garage men, and the equipment dealers, are in much better position than the dealers in passenger cars, largely because the automobile owners are keeping their cars in better condition, and watching them much more closely for immediate repair needs, in an effort to hold off the necessity for buying new cars until such time as they believe prices will come down, or money will become more plentiful.

Few if any of the garages and service stations have reduced prices for work. Most of them report all the work they can handle, yet the proprietors believe they can reduce their working forces from 10 to 20 per cent, and still handle the business. The result of this movement probably will be a better class of automotive mechanics in all the downtown business section garages and service stations.

Election of Haynes to Head Dodge Brothers Told Dealers

New York, Jan. 15—Announcement of the election of Frederick J. Haynes as president of Dodge Brothers was made at a luncheon of 1100 Dodge dealers at the Waldorf-Astoria Tuesday. The news was contained in a telegram from Howard Bloomer, chairman of the board of directors, which was read by Charles W. Matheson, general sales manager. Haynes has been a vice-president for several years and has been virtually the head of it since the death of John Dodge in this city a year ago and the long illness of Horace Dodge.

EVANS & OULD ORGANIZED

New York, Jan. 14—William A. Evans, formerly general service manager of the Packard Motor Car Co., of New York and lately in charge of the Cunningham service department, has gone into business for himself under the firm name of Evans & Ould. Offices have been opened at 1780 Broadway, and the firm will represent several lines of automotive goods as manufacturers' agents.

Will Import More Trucks If First Sale on Coast Warrants

War Department Opposition Likely to Win in Proposed Motor Vehicle Dumping

LOS ANGELES, Jan. 15—Colonel Pierce is here with 75 Packards and Rikers and starts the sale this week through a local dealer. The agent says these are the only trucks on this coast and if the sale is a success, his company will bring thousands of these war trucks to this country. The truck industry here is greatly disturbed and they have appealed to the National Automobile Chamber of Commerce and the National Automobile Dealers Association. The sale of these trucks will demoralize the used truck market and this will have a bad effect on the new truck business.

WASHINGTON, JAN. 14—Investigation here discloses that there is little probability that Representative Anthony of Kansas will be successful in his attempt to have dumped on the public some 20,000 motor trucks owned by the War Department. He has made this proposal as a measure of economy and it has been given serious consideration but it has met with the strenuous opposition of the General Staff and military considerations are likely to win the day.

Since the beginning of the war the army has purchased approximately 64,000 motor vehicles, trucks and passenger cars. It has disposed of 34,393, most of which went to state highway departments and departments of the government. The trucks on hand Jan. 1 numbered 29,881. It is contended there is no surplus now but it is expected that in the near future the army will dispose of 6850 trucks and 680 passenger cars. This would leave only 22,785 motor vehicles on hand. Of this number the National Guard of the various states will be supplied with 2479 trucks and 166 passenger cars.

Under the law the vehicles which the army does not need must be turned over to other branches of the government. New legislation would be required before they could be sold to the public and it is not believed probable that there will be any amendments to the law at this session.

Los Angeles, Jan. 10—The Motor Car Dealers Association, in response to a request by its truck members, has made a telegraph appeal to the representatives and senators from California to oppose the proposed Anthony amendment to the military appropriations bill that would compel the War department to release motor trucks in its possession on the ground that the flooding of the truck market with these trucks would be a serious handicap to business.

It is estimated that the number of trucks held by the War department, if put upon the market this year, would represent about one-seventh of the total production of new trucks. The army

trucks would have to be treated as "used" trucks regardless of whether they ever have seen actual service or not and their direct effect on the truck sales business would be in relation to the used truck market. It is pointed out that this number of high-grade, used trucks would dominate the market so as to prevent the usual trade-in sales operation. Cessation of the trade-in practice would stagnate new truck sales and lack of sales would cause production at the factories to be curtailed greatly, if not stopped.

Dallas Dealers Planning Two Automobile Shows This Year

Dallas, Tex., Jan. 15—The first annual closed automobile show of the Dallas Automobile Trades Association will be held the second week in February and later in the season the regular annual show of the Dallas dealers will be staged. The latter will probably take place at the fair grounds where there is space for housing a thousand cars.

J. A. Connell, president of the organization, says that the time has passed when the closed car in Texas is a winter vehicle and declares that the number of these cars increases from year to year and that the Dallas association must show its customers what the market has in that line. His suggestion that some of the cars from the national shows at Chicago and New York be brought to Dallas and that expert salesmen and demonstrators be employed will probably be followed.

The building to house the show will have a suitable space for dancing and the dealers expect to lend a society tinge to the event. In addition to dancing as a social feature tea and other refreshments will be served.

TIMKEN AXLE GREETS CUSTOMERS

Detroit, Jan. 15—The Timken-Detroit Axle Co. has sent the following telegram to all its customers:

"We have all gone through a trying period this year but we believe we can see some signs of life returning to business. We believe the year of extravagance and inefficiency is past and that fundamentally the country is sound and ready to resume operations and will move forward under gradual return to normal conditions through the willingness of every individual to put his best efforts into producing efficiently."

FILE PETITION AGAINST KARDELL

St. Louis, Mo., Jan. 14—An involuntary petition in bankruptcy was filed in the United States court yesterday against the Kardell Tractor and Truck Co. whose plant here has been closed for two weeks. The company has built tractors but has never produced any trucks. The petitioning creditors are:—Machine Products Co. of Cleveland with a claim of \$15,659.74; Rubelman Lucas Hardware Co. \$286.90 and William J. Kennedy Stationery Co. \$5.

Truck Sales Managers Find Problem in Used Car Market

Also Considering Plans to Effect Closer Relationship Between Manufacturer and Distributor

NEW YORK, Jan. 14—One of the main subjects considered by the directors of the National Motor Truck Sales Managers at meetings held here last week and this week has been the perfection of some practical plan for meeting a situation caused by the accumulation of used vehicles on the market, a situation that is proving to be one of the greatest stumbling blocks in the way of renewed activity in the truck market.

The sales managers are approaching the subject cautiously, however, and are not disposed to make any announcement of what they propose to do until they are convinced the proposal will be workable and will result in clearing dealers' floors of used trucks. It can be said that conferences have been held here with representatives of the larger finance companies whose co-operation has been marked. The factory representatives feel that the finance companies have been of material assistance to dealers during the great stringency.

Plan for Better Co-operation

The sales managers also are perfecting plans for bringing about a closer relationship between the manufacturers and the distributors. It is felt they have been working in the past at cross purposes and that this evil should be eliminated. The manufacturers are eager to do everything in their power to aid their dealers. They are striving to eradicate so far as possible the ills resulting from the sale of trucks to anyone who can be dragged into the sales room regardless of whether he is in a position to pay for the vehicle or whether he has any real need for it.

Secretary Babney is co-operating with the National Automobile Dealers' Association in an attempt to enlist a much larger representation of truck dealers in the latter organization. He believes that if there were a truck division in the N. A. D. A. an opportunity would be presented for the discussion and solution of problems common to all truck distributors.

4000 Trucks to Be Put on Market

The sales managers are considerably perturbed over the announcement that the Slough Trading Co. of London proposed to sell in this country 4000 motor trucks made by American companies but left in England by the American Expeditionary Forces. Information is being sought as to the purposes of this company and American truck makers will take whatever steps they can to protect themselves. None of these trucks have been placed on sale in the East as yet but those which already have arrived have been sent to the Pacific coast. A shipment is expected in this city soon, however.

Durant Re-enters Automobile Field to Make 4-Cylinder Car

Former Head of General Motors Organizes Company—Price of Product Less Than \$1000

NEW YORK, Jan. 15—The future of W. C. Durant which has caused widespread discussion since his retirement from the presidency of General Motors has been definitely settled with the incorporation of Durant Motors, Inc., at Albany. With this company he will re-enter the manufacturing field to produce a four-cylinder car which will sell at less than \$1000. It is expected the company will be in production by August and that eventually there will be two plants—one in the East and one in the Middle West.

The authorized stock of the company will be \$5,000,000, consisting of 1,000,000 shares of no par value. All the stock will be taken by Mr. Durant and close personal friends. It is significant that the day after the incorporation papers were filed, there was active trading in the stock on the curb market on a "when issued" basis. It was the understanding that the stock was offered for subscription at \$10 a share, but most of the trading was at between 13 and 14 and the turn-over approximated 3000 shares.

Mr. Durant made the following statement in reference to the new company: "While I am not ready at this time

to make an announcement, it will probably not surprise you to know that I am still an interested and firm believer in the motor industry, and that I am organizing a company controlled by myself and several of my good friends which will be in active operation Aug. 1. I cannot go into details regarding the corporation at this time other than to say it will bear the name of Durant Motors, Inc., with one kind of stock, with every subscriber to the initial offering upon exactly the same basis as to price, with no commissions, bonuses or reservations to myself or associates issued for experience, ability or performance. The Durant Motors, Inc., will be incorporated under the laws of the state of New York with authorized capital of 1,000,000 shares of no par value, 500,000 shares constituting the initial offering."

Simultaneously with the incorporation of Durant Motors, Mr. Durant severed all his connections with General Motors by resigning from the finance committee and as chairman of the executive committee. F. W. Hohensee also resigned as a director, vice-president and a member of the executive committee. Mr. Hohensee has made no announcement of his future plans, but it is generally believed he will join Mr. Durant.

DISBROW SEEKS RETURN TO A. A. A.

Indianapolis, Jan. 16—Louis Disbrow, veteran racer, has applied for reinstatement in the A. A. A. so that he may drive in the ninth international 500 mi. race, to be held on the speedway here.

To Admit Display of Trucks at Time of National Tractor Show

Space Allotted By Committee Will Provide Room for 30 to 50 Models

COLUMBUS, OHIO, Jan. 15—After considering the question for some time, the executive committee in charge of the National Tractor Show, which will be held here Feb. 7 to 12 inclusive, has decided to admit trucks to the exhibits. This action was taken at a meeting of the executive committee in Chicago when the Columbus committee made such a recommendation.

The space to be allotted to truck manufacturers will be plotted in the near future and contracts for space will be closed. This space is somewhat limited, although very desirable and is located in the Coliseum, which is the central building used for the show. There will be space from 30 to 50 trucks.

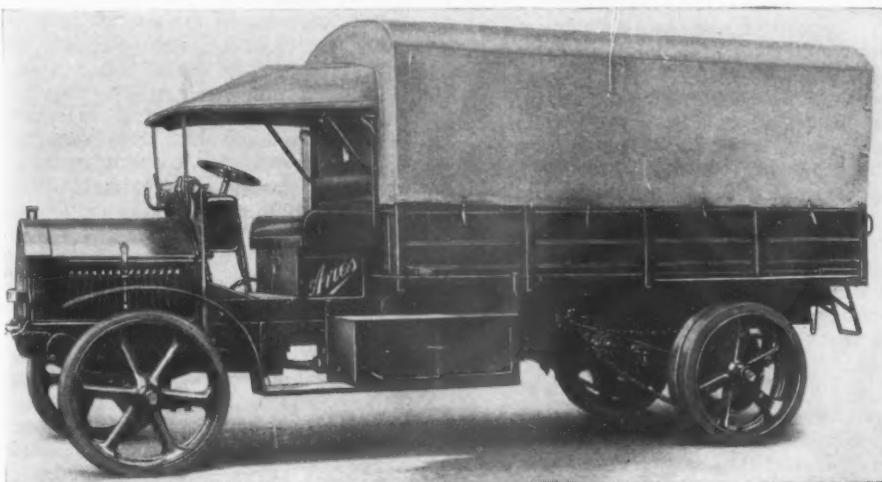
This action of the committee meets with the approval of many people who have urged that trucks, especially those used for farm work, be admitted to the show. It was urged that since the teaching of the show is the motorization of the farm, trucks could not be excluded. Farmers and others have evinced a growing interest in trucks as the solution of the farm transportation problem, which is important in view of the fact that the increased use of tractors is cutting down the number of horses on the farm.

The plans for the show are rapidly reaching completion. Practically all of the space laid out for tractor and tractor tool and machinery exhibits has been taken and it is likely that small plots will be turned over to late comers in the accessory field. The list of exhibitors now compares very favorably with that of any previous show and includes all of the more prominent figures in the tractor and allied industries. The average space contracted for is still greater than any previous year.

400 Students Are Enrolled In Camp Grant Automotive School

Rockford, Ill., Jan. 14—Equipped at a cost of \$2,000,000 the automotive school at Camp Grant is now in operation with an enrollment of 400 students in the eight departments, each with its own experts and equipment. Captain John C. Daly heads this Army school institution and he is assisted by Lieut. Roderick A. Stamey.

America's greatest automobile and tractor manufacturers comprise the advisory board and have volunteered their services and aid in any manner. Equipment of engines range from the antique 1 cylinder engine to the 300 hp. Liberty motor and the Hall Scott rotary and heavy duty tractor engines. All are assembled, overhauled, adjusted and repaired as part of the school course.



Aires 5-Ton Truck to Sell for \$5000

The Aires truck is now being represented in the United States by C. O. Assmus & Co., 1457 Broadway, New York City. Plans are under way for representation throughout the country and arrangements for service and parts are being made. The Aires truck is made in but one model this being a 5-ton job. The engine is a four cylinder Ballot, the cylinders being cast in block and having a bore of 3 1/2 in. and a stroke of 6 in. The valves are enclosed. Ignition is by a Lavallette high tension magneto and the carburetor is a Zenith. The lubrication of the engine is taken care of by a pump which automatically circulates the oil through all working parts. A safety valve keeps the pressure constant and there is a sight gage on the dash. The radiator is of cellular type and cooling is assisted by a belt driven fan. The clutch is metal disc type requiring no lubrication, and the operating mechanism is suspended on swivels, so as to be independent of all movement of the chassis. The gear set is of the selected sliding type providing four speeds forward and reverse. The gears are of the constant mesh type. The standard chassis is fitted with 40x5 in. single in front and 40x5 in. dual tires in the rear. The standard army body without hooks and canvass is \$5000.

Law Is Likely in Washington State for Aircraft Control

Would Result in Carriers Being Placed Under Jurisdiction of Public Service Commission

SEATTLE, Jan. 15—Washington will probably be the first state in the Union to take official cognizance of the airplane and balloon as potential common carriers. Several cities including Los Angeles and Milwaukee have city ordinances covering the question.

Acting on the request of Gov. Louis F. Hart, members of the State Public Service Commission and aviation experts met with him here recently and discussed proposed state regulations of all aircraft and pilots. Placing the supervision of the air traffic under the control of the commission now as are the railroad, telephone, gas, electric power and other utilities, it is believed by aeronautical experts, will mean that it will be placed where it would land eventually, anyhow. Furthermore, as it was agreed at the conference, the enactment of a state law that would place aircraft regulation on the statutes with hard and fast rules would not make for any flexibility in the conduct of the aircraft traffic. The commission, it was pointed out, would lay down its rules and would amend them, adding to or taking from them, as the need of such alteration developed.

President D. E. White of the Aero Club of the Northwest declared his belief that when other states saw Washington place its aircraft in the hands of the Public Service Commission they would do likewise, many aeronautical societies, realizing the need of air traffic rules, airplane inspection and pilot examination, having withheld their approval of any set of rules until some concrete manner of administering them appeared. Placing this matter in the hands of the same commission which has jurisdiction over all other common carriers, it is believed by Mr. White, will solve this problem.

Fiat Enters Three Cars for French Grand Prix July 23

BY W. F. BRADLEY

European Correspondent of Motor Age

Paris, Dec. 25—Fiat has just entered three cars for the French Grand Prix 183 cu. in. race to be run on July 23, probably at Strasbourg. This is the first appearance of the big Italian firm in an open speed contest since 1914. Drivers selected for these cars are Louis Wagner, who frequently raced for Fiat prior to the war, and the two Italians, Minoia and Bordino. The two latter have figured up to the present as mechanics on Fiat racing cars and have visited America on several occasions in this capacity.

The only other cars at present registered for the French classic are four Ballots, with Ralph De Palma and Jean Chassagne picked as drivers. Owing to

the high fees to be paid, Europeans are keeping out of the French Grand Prix until the last moment. The following, however, are certain to race: Peugeot with five cars; Sunbeam with four cars; Darracq with three. Possible starters are Renault, Gregoire, Mathis, Bugatti. The club has the right to cancel the race if thirty entries are not received, but indications point to a minimum of twenty, and as a very short course has been selected, the race will be held with this number of cars.

Quincy Used Car Exchange to Be Established Shortly

Quincy, Ill., Jan. 15—Quincy's automobile show, which opens in the Armory March 1, will be the greatest in the city's history and contracts are being let for decorating and other work incident to the display. The second evening a dinner will be given for members of the Auto Trades' association and among the guests will be Harry Mooock, general manager of the National Automobile Dealers' Association, and Col. Robert E. Lee, manager of the St. Louis show.

Organization of a used car exchange is reported to be fairly under way and it will be established within a short time.

ASSOCIATION QUESTIONS TRADE

Hartford, Conn., Jan. 14—In an endeavor to obtain inside information as to the actual status of various dealers in this city, the Hartford Automobile Dealers' Association sent out a questionnaire to every member. The inquiry was sent in a plain envelope with a stamped envelope enclosed for reply. More than half of the dealers responded and from this it was ascertained that the various car sellers are in good shape for the coming season. Among the questions to which answers were requested were the number of cars, new and used, on hand, amount of money represented by used cars and the volume of business during the past three months as compared with the corresponding period of a year ago.

TO SAVE TIME IN REPAIRING

San Francisco, Jan. 15—A. Jakovleff has perfected an invention consisting of a unique arrangement by which the pressure of one finger on a lever swings an automobile on a longitudinal axis so that the transmission and other underparts of the chassis can be repaired from a standing position making possible a great increase in labor efficiency and time saving, it is claimed.

REPUBLIC RUBBER OPENS

Youngstown, Ohio, Jan. 14—Operations at the plant of the Republic Rubber Corp., were resumed Jan. 10, according to President E. F. Jones. All of the departments including pneumatic tires, tubes and solid tires will work on three eight-hour shifts. The mechanical goods department will resume Jan. 17. The plant was closed Dec. 23 for inventory and repairs.

Youngstown Nestor Retires After 40 Years in Business

Carriage Company Sold to Another Pioneer in Industry at Approximate mately \$300,000

YOUNGSTOWN, OHIO, Jan. 14—The Henderson-Overland Co., distributors for the Willys-Overland line of passenger cars, the Handley-Knight and the Garford truck, have purchased the buildings, land and fixtures of the Youngstown Carriage Co., representatives of the Studebaker passenger cars and Federal trucks, and will take possession April 1. Warren P. Williamson, head of the carriage company, which he established forty years ago, is the nestor of the automobile business in Youngstown. He retires from the automobile world to devote his time to a real estate business in which he is heavily interested. J. J. Knotts, sales manager of the carriage company, goes with Mr. Williamson.

James A. Henderson, president of the Henderson-Overland Co., began business eleven years ago in the southern part of the city in a barn for which he paid \$8 a month rent. After buying his first demonstrating car and wearing out the tires trying to sell it he found that his capital was not sufficient to buy new tires. Monday he paid nearly a third of a million dollars to Mr. Williamson who in 1881 would have considered \$300 as a fortune.

In the early days of motor vehicle construction, Mr. Wilkinson built a 3-cylinder model at a cost of \$12,800. In this vehicle he and others made a trip to Cleveland and back which required twenty-four hours. One stop was made to pick up the drive shaft that had jolted out. His experiments were intended to improve on the 1 and 2-cylinder types then being developed. Results of the experiments were so discouraging that Mr. Williamson turned back to carriage building. This department of the business has gradually become confined to wagon building, truck body building, painting, heavy blacksmithing and forging for the automotive business. Since 1911 one line of passenger cars and trucks has been handled. Both concerns have been members of the Youngstown Automobile Dealers Association since its organization.

WESTINGHOUSE CENTRALIZES

Springfield, Mass., Jan. 15—The automotive equipment department of the Westinghouse Electric & Manufacturing Co. has recently completed plans which will increase greatly the efficiency of its service to automobile manufacturers, owners and parts distributors. Owing to conditions brought about by the war the main sales office of the department, the works, the engineering division and service division were located in different cities. Through establishing all divisions at Springfield there has resulted a unification of action which is looked upon as being very advantageous.

Cab Company to Make Cars and Trucks in Quantities

Production Will Center on 4-Cylinder Model of Moderate Price, President Says

CHICAGO, Jan. 12—Passenger cars and light trucks will be manufactured in quantities immediately by the Yellow Cab Manufacturing Co. of this city, according to an announcement of the president, John Hertz. The company for several years has concentrated its efforts on turning out 2,000 cabs yearly for use in taxicab service in this and other cities.

One of the passenger cars will be known as the "Ambassador" and will be built in touring, closed, sports and imperial sedan models of 2, 4 and 7-passenger sizes. Greater production, however, will be on a 4-cylinder car, of moderate price, worked out on the Yellow Cab chassis. This line will consist of a 4-passenger coupe, sedan, touring car and roadster.

The trucks will include a 1-ton speed wagon and a 1 1/4-ton speed truck.

The cars will be exhibited at the Chicago automobile show for the first time. The "Ambassador" will be on display at the New Drake Hotel and at the show rooms of the distributors, Esch and Hammond, 2216 South Michigan avenue, this city.

Manufacture of the cars and trucks will be made in the new factory of the company at Menard and Dickens streets and will mean an investment of several million dollars, according to Mr. Hertz.

OTHER BUSINESS MEN AT MEETING

Memphis, Tenn., Jan. 14—C. B. Lyon, district manager of the Dodge Brothers Motor Corp., and R. L. Jordan, cigar wholesaler, in addresses at the year end luncheon of the Memphis Automobile Dealers Association reported, after a survey of the Southern field, that there were prospects of improved business and a good Spring. President Steve H. Butler made a short talk on automobile topics. Remarks were also made by Gus Schlecht and Owen Lilly, automobile dealers; Frank N. Fisher, coal dealer and J. M. Walker of the O. K. Storage & Furniture Co.

COTTON AS PAYMENT FOR CARS

Memphis, Jan. 14—The Memphis Motor Car Co., Hudson and Essex distributors, in marketing their used cars announce that sales will be made for part cash and part cotton or all cotton, the cotton to be shipped to Memphis and properly classed. They thus show confidence in Dixie's staple and their resources are such that they can hold cotton until a demand makes it marketable for cash.

100 NEW MEMBERS IN A MONTH

Memphis, Tenn., Jan. 15—The weekly luncheon of the Memphis Automobile Dealers Association at Hotel Gayoso, this week was presided over by President

Steve H. Butler and featured with honor guests in the person of R. H. Hart and C. A. Noon, of Chattanooga and W. F. Stockell, of Nashville. Mr. Noon is general counsel of the Tennessee Automotive Trades Association. In a talk on general conditions in the state organization in recent months, it was brought out that business conditions in the eastern section of Tennessee are much more active. More than 100 new members from among the country dealers have joined membership in the state association since the middle of December.

Unemployed Are Brought To Akron Through False Reports

Akron, O., Jan. 14—The publication of false reports in many of the papers, caused several thousand laborers to come here searching for work in the rubber factories. The increase in production is actual in that the present forces are gradually being restored to normal working hours. They are not going to put on any more men until the hours are back to full time. The city is trying to prevent the influx of hundreds of floaters who are hunting jobs by sending out word that Akron has enough unemployed without increasing its forces. The charity organizations have appropriated \$55,000 for the immediate relief of the city's present 20,000 unemployed.

Fisk President Chosen New Head of Rubber Association

New York, Jan. 14—Harry T. Dunn, president of the Fisk Rubber Co., was elected president of the Rubber Association of America at the annual meeting of the directors here. He succeeds Homer E. Sawyer of the U. S. Rubber Co., who has served two terms. The other officers chosen were: First vice president, F. A. Seiberling, president of the Goodyear Tire & Rubber Co.; second vice president, Horace DeLisser, chairman of the board of the Ajax Rubber Co.; secretary and general manager, A. L. Viles; treasurer, William C. Cox. Prior to the meeting of the directors the organization elected five directors who were: Messrs. Seiberling, Dunn, DeLisser, William O'Neill, vice president of the Central Tire & Rubber Co., and F. R. Henderson, president of F. R. Henderson Rubber Co., dealers in crude rubber.

DISTRIBUTOR REORGANIZES

Rockford, Ill., Jan. 14—To take care of expansions found imperative, the Williamson Motor Co. of this city which maintains distributors and service stations here and at Durand and Pecatonica has found it necessary to increase the capital stock to \$100,000. The re-organization plans for the issue of 650 shares of common stock with a par value of \$100 and to be paid for by transferring \$65,000 from the surplus to the capital stock account. The company handles Ford cars and Fordson tractors.

\$637,500,000 Available for Road Construction in Union

Amount Includes Federal, State and County Appropriations and Is Largest of Any Year

NEW YORK, Jan. 14—For public highways—\$637,500,000.

This is the staggering total available in the 48 states of the Union for expenditure this year on road construction. The total includes federal, state and county appropriations. This amount is nearly 50 per cent more than was spent in ten years in building the Panama Canal and nearly six times as much as New York state spent on its great barge canal.

The amount is the largest ever made available in any one year for road building and it is believed that with materials lower in price, labor plentiful and transportation normal the mileage of construction will surpass any previous mark. A quarter of the total comes out of the Federal aid fund and this source of supply will be exhausted by the beginning of 1922 unless additional funds are provided by Congress, which is not likely at this session which has "Economy" as its slogan.

With such an enormous amount to be used in road building, the various agencies interested in improvement of highways are actively concerned in having it expended wisely and economically. The main purpose is to have the roads built where they will do the most good and carry the most traffic. The subject of substantial and economical construction is next in importance. One of the important factors in lower costs is found in the fact that labor is not only plentiful but cheap. Common labor for road building is available in some of the southern states at \$1.50 a day.

FIRM NAME CHANGED

Philadelphia, Jan. 14—The Bigelow-Willey Motor Car Co., handling Paige cars, has changed its name to the Guy A. Willey Motor Co. and will move to new quarters directly after the Philadelphia show. The business was started about three years ago and the active management was taken over by Mr. Willey upon the death of Mr. Bigelow. The business has prospered to the extent that larger quarters are necessary and the new building will afford improved facilities for both the company and its customers.

KENTUCKY TIRE AGAIN SUED

Louisville, Ky., Jan. 14—Ink was hardly dry on an order dismissing an action for a receiver of the Kentucky Tire & Rubber Co. in the Circuit Court when another similar action was filed. Among the allegations in the petition was one to the effect that the officers of the company had failed to begin operation of a factory in Louisville by Jan. 1 for the manufacture of automobile tires.

Concerning Men You Know

Daniel G. Thorne, formerly district manager for the Diamond T Truck Co., has joined the Republic Truck Co. organization and will have charge of sales to national buyers such as oil companies and other organizations doing business in all parts of the country.

Harry A. Oswald, recently named general manager of the Hamilton Motors Co., Grand Haven, Mich., manufacturers of the Apex truck, was formerly connected as chief engineer with the Quaker City Corp. of Philadelphia and has been associated with the Garbowski Motor Truck Co. of Detroit as chief engineer and with the Meridian Manufacturing Co. of Indianapolis as general manager.

H. F. Zinke and **E. R. Zamzow** have taken over the management of the Crescent Motor Co. of Fond du Lac, Wis., handling the Studebaker, Overland and Willys-Knight cars. At the annual meeting of the company the following officers were elected: Robert Zinke, president; Mr. Zamzow, vice president; A. R. Zinke, secretary-treasurer, and H. F. Finke, general manager.

Hamilton W. Jones, lately with an American exporting house as South African representative, has joined the A. C. Hine Co., Hartford, Conn., as sales manager.

F. W. Potts, for several years northwestern district manager of the Republic Rubber Co., with headquarters at Minneapolis, has resigned effective Jan. 15. No announcement has been made of his future plans.

W. G. Jarman has resigned as general manager and secretary-treasurer of the Hamilton Motors Co., Grand Haven, Mich. Mr. Jarman formerly was sales manager of the Jackson Automobile Co.; prior to that, Canadian manager for Briscoe, and earlier was connected with Maxwell, Briscoe and Ford.

B. M. Ellis is president of the B. M. Ellis Motor Co., Columbus, organized to distribute the Lincoln cars in Columbus and central Ohio. Mr. Ellis has been connected with the Standard Motor Car Co. for the last eight years and his experience in the sales of automobiles dates back for almost twenty years.

Victor M. Stamm, one of the best known figures in the tire and rubber trade of the northwest, has resigned as manager of the Milwaukee branch of the United States Rubber Co. after seven years of service, to engage in the life underwriting business.

Ludwig T. Kuehl, of Racine, Wis., has been elected a director and vice-president of the Northeastern Rubber Co., New York, succeeding George G. Bryant of Milwaukee. Richard G. Bryant of Racine is president and treasurer. Charles E. Davies has been elected a director and secretary.

Senator F. T. Newton has been appointed sales director of the Apex Motor Corp., Ypsilanti, Mich. H. F. Greene, a veteran of fifteen years standing in the automobile industry has joined the company's forces as district sales representative.

S. C. Mitchell has been appointed district sales manager of the Cleveland Tractor Co. of St. Louis, where a district sales office has just been established. The territory covered by this office borders the Mississippi from Illinois to the Gulf.

J. H. Desmond, for the past three years district manager for the Hart-Parr Co. over their Canadian territory, has been placed in charge of all salesmen in the field and will have his headquarters at the factory at Charles City, Ia.

Alfred Weiland has been appointed assistant to the president of the Pierce-Arrow Motor Car Co., acting for the president in matters relating to engineering.

Forest H. Akers, for the last seven years associated with the Reo Motor Car Co., of Lansing, in various capacities, having been for the last three years general sales manager, has been appointed assistant general sales manager of the Republic Truck Sales Corp., of Alma, Mich. He will assume entire control of the Republic field organization. Ernest E. Sieg will continue as assistant general sales manager to A. J. Whipple and will have charge of all sales activities except those of distribution which will be taken care of by Mr. Akers.

Newer Hartford Association Absorbed—To Hold One Show

Hartford, Conn., Jan. 15—Fourteen new members were admitted to the Hartford Automobile Dealers' Association at a meeting held this week. Ten of them were affiliated with the Automobile Trades Association of Hartford, organized a year ago to give an independent show which became necessary because none of the members of the new association were eligible for membership in the original organization. With several other new members admitted a short time ago the total membership has been brought up to 45.

Inasmuch as the new members included the leaders and founders of the trades association it is obvious that Hartford will have but one show this season and that larger and better than ever. Local business is none too brisk at present and there is a feeling among some of the dealers that an earlier show would help matters while others, of course, hold that the specified time, Feb. 12 to 19 is most propitious. There has been a marked improvement in tone, however, during the past week.

FORM AERONAUTICAL SOCIETY

Birmingham, Ala., Jan. 13—The Alabama Aeronautical Society, affiliated with the Aero Club of America, has been organized here. Lieut. Commander C. W.

ing actual production; that production started Sept. 1, 1920, and by Jan. 1, 1921, 800 cars were shipped. It also states that according to the best information at hand at the present time it will have shipped, within twelve months from the date when production started, the estimated total of 6000 cars.

DISTRIBUTORSHIP REORGANIZED

Nashville, Tenn., Jan. 14—Through the reorganization of the Brockway Motor Truck Co., Inc., of Tennessee, Stanley Miles, for eighteen years general agent of the American Seed Machine Co. here, becomes president; T. G. Holland, formerly of Baltimore, vice president, and R. M. Jackson, secretary-treasurer. Sidney Rather is service manager.

1921 DESIGNS FROM THE VIEWPOINT OF SERVICE

(Continued from Page 12)

there has been some effort put forth by the makers to stiffen their present designs. The frame joints are better made and there is a generous use of gusset plates. There are more rivets used in some of the frames than formerly and in many instances the frames have a slightly deeper section. Most of the makers now use a leather packing between the frame and the sills of the body to eliminate squeaks. The same construction also is used between fenders and body on many of the cars. This elimination of body and fender squeaks means much to those who have to service cars, because squeaks and rattles have been among the chief offenders in former years and usually hard to locate or remedy.

Upholstery looks and is much neater on this year's cars. While it is true we formerly used good materials for upholstery the fact remains that the edges usually presented a rather unfinished look. This was due largely to the fact that the makers attempted to make their own binding and usually tacked it in place so the tacks were exposed to view. Also, the material used for the binding was too thin and did not fold well. In the last year or so there has appeared a binding material which the maker can buy and which is vastly superior to the old hand-made variety. It is of thicker material and held in place by invisible tacks.

There is no question but what the finish on the bodies of this year's cars is better than last year. Pigments are easier to get now than last year and besides the paint departments of the factories have more time to devote to the cars. When production is abnormal usually the finishing department has to slight its work because it is the last department to work on the car and with heavy pressure from behind it is but natural to rush the cars through. Service work on the finish of a car body or fenders is among the most difficult because the average service station is not equipped to handle it. But with better colors and materials and with better application of these as now is the case little difficulty is anticipated this year.

Tindal, formerly of the United States Navy, was the organizer of the Alabama club, and a branch of the society is shortly to be established in every county in Alabama. It will be conducted along the same lines as the New York State Flying Club and the Missouri Aeronautical Society.

FEDERAL RUBBER OPERATING

Milwaukee, Wis., Jan. 14—After a curtailment of production for about a month, the Federal Rubber Co. of Cudahy, a suburb of Milwaukee, resumed operations today with a force of about 900 men, or about 40 per cent of capacity. According to Arthur A. Frank, factory manager, business has improved substantially while a proper readjustment of stock and materials has been effected. He looks for continued increase in operations from this time forward. The Federal was one of the last of the larger tire manufacturers to curtail when over-production set in.

LINCOLN MOTOR PRODUCTION

In the tabulation appearing in MOTOR AGE of Dec. 23 relative to the proposed and actual production of certain automobile companies during the year 1920 it was stated that the estimated production of the Lincoln Motor Co. was 6000 and that actual production was 285. The company advises that it planned to build a total of 6000 Lincoln cars within twelve months from the date of start-

No Note of Gloom Sounded at Annual Dinner of N. A. C. C.

Same Confidence as Was Apparent at National Show—Bankers Present as Guests

NEW YORK, Jan. 14—Nearly 700 representatives of the automotive industry, most of them passenger car makers and officers of their companies, attended the 21st annual dinner of the National Automobile Chamber of Commerce held at the Commodore Tuesday night. There was no atmosphere of gloom but rather the reverse. The diners seemed to feel that the worst is over.

The note of confidence which has permeated the show dominated the dinner. The men who attended were a bit more serious than they have been some other years but the seriousness was born of determination to succeed rather than discouragement. It was significant that a score of the most prominent automobile bankers in the city were interested guests.

The Medals of Merit

The annual awards of medals evoked howls of mirth. The victims were Walter P. Chrysler, Henry M. and W. C. Leland, Windsor T. White, Emlen S. Hare and A. I. Brousseau, president of the International Motor Co.

Chrysler was told that he was decorated because he had been so successful in standing around where he could be "discovered" by C. W. Nash and John Willys. His medal was given for his success in ironing out complications in the industry and it was remarked he found time to get behind the scenes in the Maxwell-Chalmers two ring circus.

The diners rose to greet Henry M. Leland and his son when they were called to the platform. They were told they had been summoned to find out when they would get into production and they were advised that if they had made mistakes not to admit them now but to wait until their car gets into the hands of the people.

White was complimented because he had "blazed" the way for the industry "in an inflammatory sense." It was remarked that he had "removed some of the surplus weight" from his passenger car and "labelled the invention a truck."

Hare was hailed as a man who was brave enough to tackle anything once and one who, in the goodness of his heart, had rescued "several grand old museums of by-gone days."

Brousseau, it was asserted, was most revered by the road building machinery dealers because he was the maker of "graceful rolling warehouses" which were invaluable as road destroyers.

VAN BRIGGLE SUED AGAIN

Indianapolis, Jan. 15—Another chapter in the troubles of the various Van Briggle industries was begun Monday, when William E. Reiley, receiver for the Van Briggle Manufacturing Co., filed

suit in the Marion Superior Court asking damages of \$100,000 in behalf of the company against L. H. Van Briggle, Ulric Z. Wiley, Henry Rominger, Frank Hilgemeier, George Weidley, and Joseph Shepard, directors of the company. The company has been operating two plants, one at Mooresville, Ind., and one at Fowler, Ind. The manufacture of an automobile trailer was the main business of the company. The suit is similar in character to the one brought several weeks ago by the receiver of the Van Briggle Motor Device Co. for damages amounting to \$275,000.

General Conditions Warrant Reopening of Comet Factory

Decatur, Ill., Jan. 15—The Comet Automobile Co. reopens next week with a small force of men, according to announcement of George W. Jagers, president, who has returned from a tour of leading middle west dealers. General conditions warranted beginning of operations, Mr. Jager said.

B. B. Burns, president of the local automobile dealers' organization and owner of the Decatur Automobile Exchange, has been appointed assistant to the president of the Comet company and has taken up his duties. He will continue operation of the automobile exchange, although his greater attention will be given to the automobile plant.

Repair Men in Cedar Rapids Agree to Lower Labor Costs

Cedar Rapids, Ia., Jan. 15—Following serious objection by some dealers when heads of a few repair shops here began a campaign to restore pre-war prices for labor on automobiles, the repair men have come around to the demand for lowered costs and have fallen in line for a return to cheaper labor. Demand of the public for such action is given as the reason by the garage men who started the move.

The price for labor is now \$1.25 an hour, with mechanics receiving an average of 80 cents an hour, according to reliable information from garages. When declines in repair labor were reported in other cities many protests were heard, drivers claiming they would put up their cars rather than continue paying for labor at the war-time rate. The reduction followed.

TRAILER MAKERS ELECT

New York, Jan. 14—J. H. Fertig, of the Arcadia Trailer Corp., Newark, N. J., and H. C. Fruehauf, of the Fruehauf Trailer Co., Detroit, were re-elected president and vice president respectively of the Trailer Manufacturers' Association of America at the annual meeting here. Max Herrmann of Beloit, Wis., was elected second vice president and Henry M. Wood of Cincinnati, secretary-treasurer. Messrs. Herrmann and Wood were also chosen to serve on the executive committee.

Marmon Dealers Learn What Their Fields Can Produce

Territorial Analyzation Is Part of Opportunities Exhibit at New York Show

NEW YORK, Jan. 15—Something unique in the line of factory sale extension effort was introduced by the Nordyke & Marmon Co. during the New York show and is scheduled to become an important feature of the Marmon exhibits in several of the season's larger shows.

It is known as the "Dealer Opportunities Exhibit" and is designed primarily to attract the attention of desirable dealers and sell them the Marmon idea. The exhibit comprises a series of screens upon which are mounted specimens of the various sales extension activities of the factory sales organization and presenting a detailed outline of what the factory is doing to assist its dealers in merchandising its products.

While it is expected that the exhibit will interest many dealers and influence them in the desirability of the Marmon contract, and its promise of real merchandising assistance, it is not the plan of the Nordyke & Marmon sales department to depend entirely upon the exhibit to make the contact with these individual dealers at the shows. The exhibit is, rather, a closing room, where dealers that are desirable through territorial location or for other reasons, may be brought by Marmon distributors for a detailed exposition of the Marmon merchandising plan—where the closing effort in the sale of a Marmon dealer contract is made.

Selling the Dealer

Within a few days after the exhibit was opened in New York factory representatives in attendance noted not only the fact that it was selling Marmon to the dealers who were casual visitors, but it was actually selling existing Marmon dealers on the advantages of their contracts.

The exhibit shows how the factory sales organization is prepared to assist in the merchandising of Nordyke & Marmon products through its advertising, sales letter, sales and service instruction, territorial analyzation and other activities in the interest of its dealers.

To some of the Marmon dealers it proved a revelation for, while they were more or less familiar with the things the factory was doing toward sales stimulation, many of them realized for the first time that they were not availing themselves fully of the opportunities that were within their reach and they left strongly sold.

One of the features of the exhibit that was particularly interesting to visiting dealers was the Marmon plan of territorial analyzation. In this section maps showing graphically the distribution of population, property valuations, car registration and were displayed.

NEW FLOATLESS CARBURETER DEVELOPED

Known as the La Fehr—Uses Velocity Head for Mechanically Vaporizing Fuel

THE floatless carbureter which relies upon a velocity head for mechanically vaporizing the fuel is exciting quite considerable interest in Europe. The accompanying illustrations show the LaFehr floatless carbureter, which is now being manufactured in Detroit, and which has excited considerable interest among automobile manufacturers in this country, and is at present on test in the laboratories of some of the Detroit manufacturers. The carbureter depends on velocity head practically entirely for its functioning. It does not use hot air and tests show a remarkable starting ability in cold weather with present fuel.

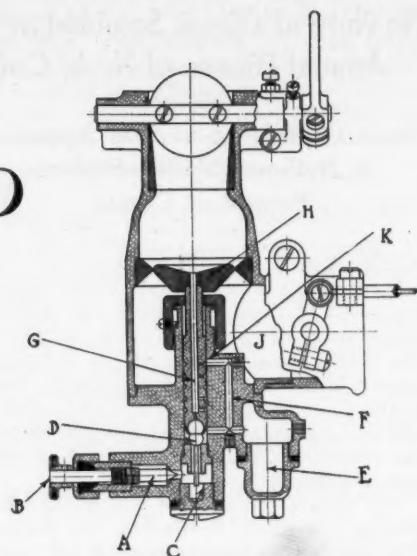
Sectional Drawing Describes Operation

Referring to the sectional drawing, the fuel enters the passage A from the tank through the usual type of connection. A needle valve controlled by the milled nut B controls the pressure flow into the passage C below the jet. Cranking the engine relieves the ball check D which is part of the metering pin G. Gasoline flows past the ball check valve, after it has lifted, into the chamber E and also in the passage F. If the engine is running rapidly and the suction is sufficient the chamber E is exhausted and all the fuel passes up through the chamber F at very

high velocity. On shutting off the engine, the chamber is again refilled. The function of this being to prevent pumping of the gasoline due to the rising and falling of the needle valve G and to furnish a starting and accelerating supply.

Graduated Jets

In normal operation, the fuel is passing through the passage F, taking right angle turns at C, at the point of leaving the ball check, at the point of entering the passage F, and again at the top of passage F, back to the jet centerline where fuel enters through openings in the metering pin G. There are a number of these openings which register with the port K. As the suction of the engine increases, the cone H at the top of the metering pin is lifted higher, allowing the graduated jets to register with the port K. This increases the fuel supply in proportion to the demand of the engine. Air enters through the usual type of passage J and passes the cone H, which gives it a whirling or vortex effect. The metering pin G is grooved at each of the openings so that if it turns on its seat there is no interference with the flow from the port K into the proper opening in the metering pin G. The jet or nozzle passes through the center of the metering



Construction and detail section of the LaFehr floatless carbureter

pin and the mixture occurs immediately above the cone H where the air flow picks up the gasified fuel.

Compact Construction

The gasifying effect, due to the extreme velocity of the fuel and the right angle turns in the direction of flow together with the sudden expansion on leaving the jet at the center of the cone, produces, it is claimed, a virtually dry gas. Due to the absence of the float parts, the carburetor is very compact.

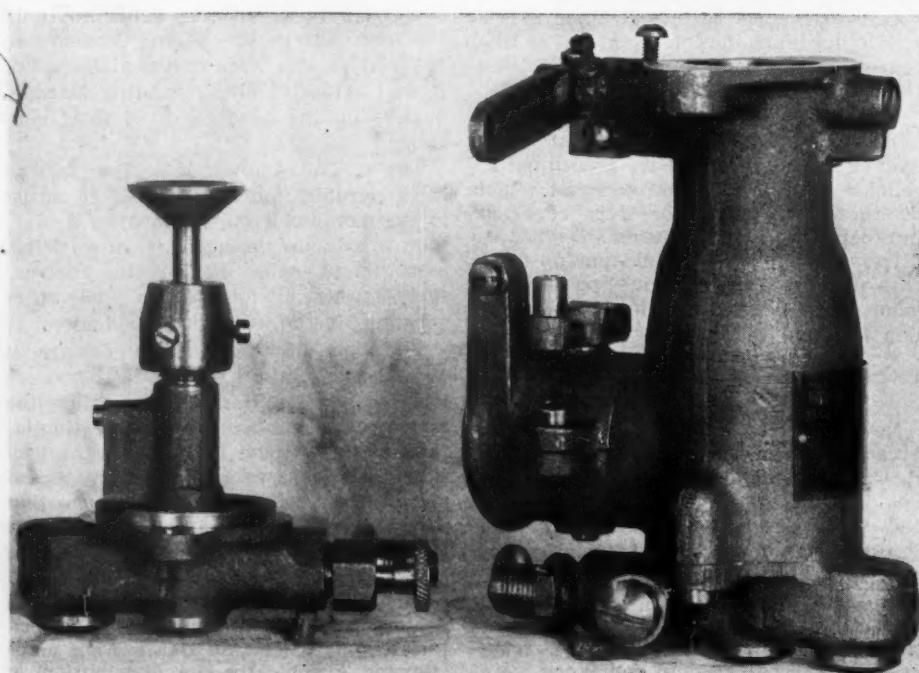
A contract has been closed with the LaFehr Floatless Carburetor Sales Co. of Chicago to handle the retail sales. The manufacturers' equipment business will be taken care of by the Detroit Carburetor Corp. Production has already started on the Ford sizes.

DUTY PLANNING TO ENLARGE

Chicago, Jan. 13—The Duty Motor Corp., which has been incorporated for \$500,000 under the laws of the state of Illinois, is manufacturing a 2-ton capacity truck which sells for \$1490 and is contemplating the erection of a large factory in the early spring in Greenville, Ill., to increase production. The following have been elected officers of the corporation: President, W. H. Rutherford; vice-president, W. J. Gubser; secretary-treasurer, J. P. Snowden; and sales manager, Paul Harnetiaux.

CHAMBERLAIN AT YOUNGSTOWN

Youngstown, O., Jan. 14—P. E. Chamberlain will address the automobile dealers of the Mahoning and Shenango valleys on the night of Jan. 19 in this city. Plans are under way for the gathering of dealers of the Mercer County Auto Trades Association, the Lawrence County Auto Trades Association, both of Pennsylvania; and the Trumbull County Auto Trades Association, E. Liverpool Auto Trades Association and the dealers of Youngstown, all of Ohio, for the meeting. It is planned to have Warren E. Griffith, Toledo, president of the Ohio Automotive Trades Association, as one of the speakers.



Exterior view showing metering unit removed of LaFehr floatless carbureter

Belgium Producing on Pre-War Basis

*Recent Show at Brussels Unites Belgian Manufacturers
Although They Are Outnumbered by Foreign Makers*

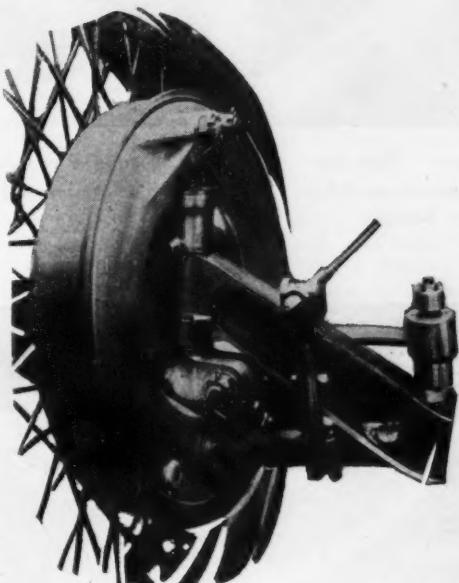
BELGIUM, possessing one dozen automobile manufacturers and employing about 8000 men in her factories, with another 7000 in body and accessory works and forges, had to send an invitation to foreign manufacturers in order to fill her first post-war show. The exhibition held in the Palais du Cinquantenaire from Dec. 10 to 19, and officially visited by the King, united every Belgian manufacturer, but these were outnumbered by foreign makers. France had the biggest share in the show, with seventy-five exhibitors of passenger cars; America had fourteen car makers, Belgium ten, Italy six, Great Britain four, and Holland and Switzerland one each. In addition to passenger cars, the show comprised truck, tractor, body and accessory sections, with a total of 309 exhibitors. This constituted a record, for the last show, held just before the war, did not unite more than two hundred exhibitors.

Not much more than a month ago London held its motor show with the participation of most of the leading Continental and American manufacturers, and since the French show of a year ago there have not been many changes in design. As a consequence it was not to be expected that very much in the way of novelties would be found on other than the Belgian exhibits.

Twenty-five months have elapsed since Belgium was freed from German domination, and in that time factories have had to be equipped, designs prepared and new models produced. The end of the war found the Belgian automobile makers with nothing more than bare

By W. F. BRADLEY

European Correspondent of Motor Age



The front wheel brake construction on the Excelsior

factory buildings, for all machinery had been sent into Germany. In addition, most of the steel works and forges had been entirely destroyed. Within these two years the industry has been put on its feet and is now producing on a basis equal to pre-war days.

The spirit of enterprise and determination shown by the people in getting back

to work is all the more remarkable in view of the fact that no special protection has been afforded. Unlike any other country in Europe, Belgium has the same import duties as before the war, with the result that foreign competitors have been able to step in and secure an important place on her market. The greatest change since pre-war days is in the importation of American cars. Before the war these were practically unknown in Belgium, whereas at the present time at least twenty makes are selling on this market.

America has created this position for herself despite very adverse rates of exchange; she had in her favor, however, the ability to make deliveries at a time when other nations were not producing. The position of France on the Belgian market has not undergone any appreciable modifications; exchange is slightly in favor of the French manufacturer, but it is only during the last six months—or since the depression set in—that he has been in a position to export. England has not changed her position on this market, and does not do a great volume of business. Her motor bicycles and motor accessories seem to be more appreciated than her cars.

New Italian Cars

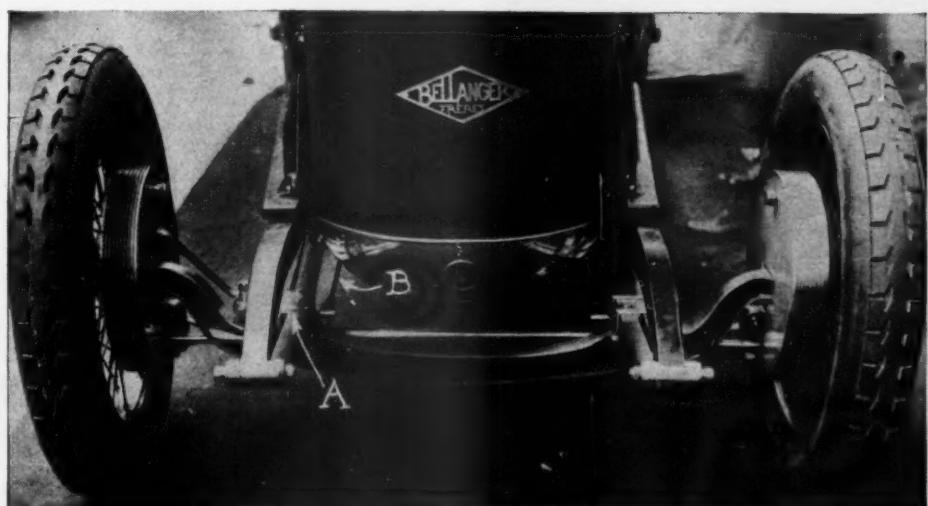
Outside the Belgian exhibits the only entirely new cars at the Brussels show were the Italian Ansaldo; the French Fonck and the Beck.

The Fonck is an entirely new production, established by the well-known French aviator, with the assistance of a former Hispano-Suiza engineer and the backing of the Jacob Holtzer Steel Co. Two cars are to be produced, a four and an eight ahead, of the same general design, but with the difference that the eight will have brakes on all four wheels and the four the usual brakes on transmission and rear wheels. Only the complete chassis of the four found a place in the Brussels show, the eight being limited to the engine and gearbox.

It is claimed that the four cylinder model will furnish more than 60 miles an hour with a four passenger touring body.

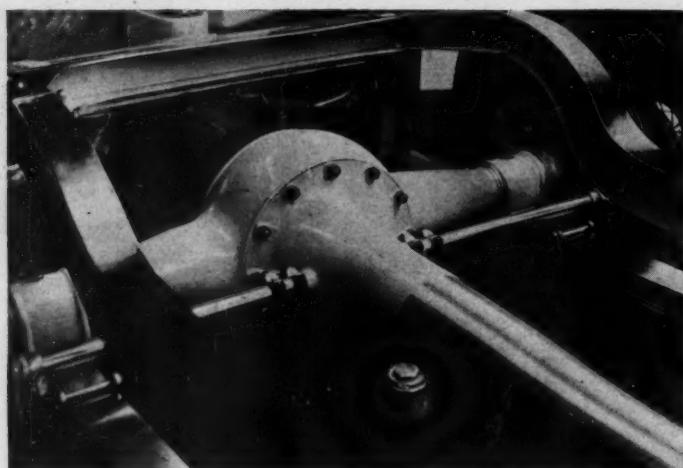
Ansaldo, the biggest general engineering firm in Italy, has now entered the automobile field with what is considered in Europe a medium, general service, economical automobile. This is a class of car which has no counterpart in America, for it is smaller than the Dodge type and has a higher finish.

There is a lot of original work in the Beck light car, a small four cylinder of

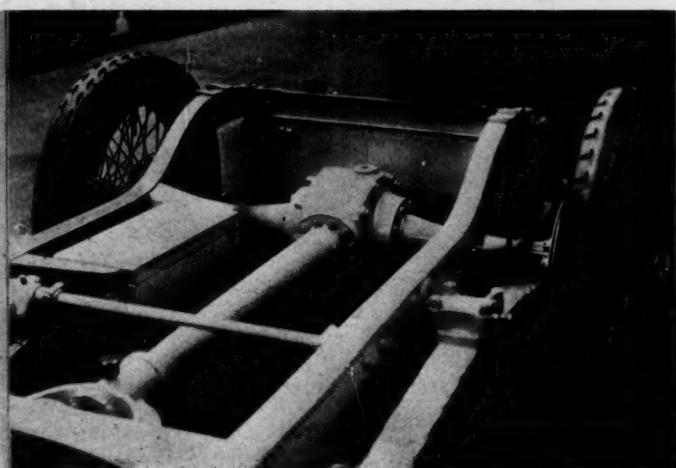


Front view of the Bellanger, showing the front wheel brakes. Note also the double springs A and the operating cables for the brakes B

Features of European Cars Shown at the Brussels Exposition



The forged rear axle on the Metallurgique. Note the filler cap for the differential housing, made accessible through removal of the tonneau floor boards



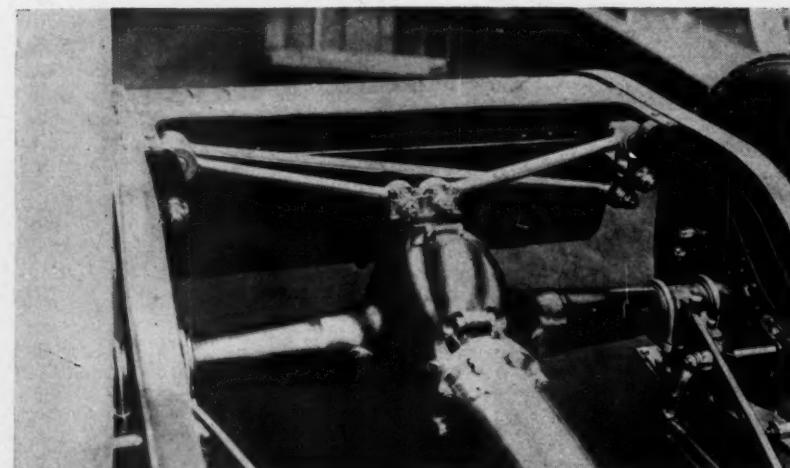
Renault re-inforced rear axle and cantilever springs. The pinion adjustment is made by removing the plate in the circle



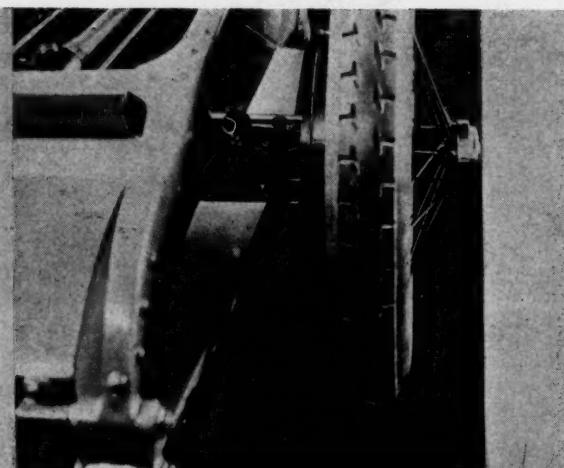
Excelsior compensating attachment of axle to frame. The cantilever springs are attached by a short connecting rod with ball and socket end, the whole being fed from an oil reservoir



The Hotchkiss now uses cantilever springs. The filler plug for the differential is located in the top of the housing



The neat spring layout on the Metallurgique. The spring is 68 in. in length



One of the features of the Fonck is the springs, which are made with a taper from the axle

2.5 by 4.4 in. bore and stroke. It has block cast cylinders with detachable head and overhead camshaft driven by a vertical shaft and bevel gearing from the rear. By this arrangement the electric generator and the magneto are placed at the rear, but there is no loss of accessibility, for the distributor end of the magneto is outwards, directly under the steering column.

Among the Belgian makes one of the most distinctive cars is the new Excelsior, a high-class six of 3.3 by 5.5 in. bore and stroke. The engine is an L-head type in one casting, with a counterweighted crankshaft carried in four bearings and machined entirely out of the solid.

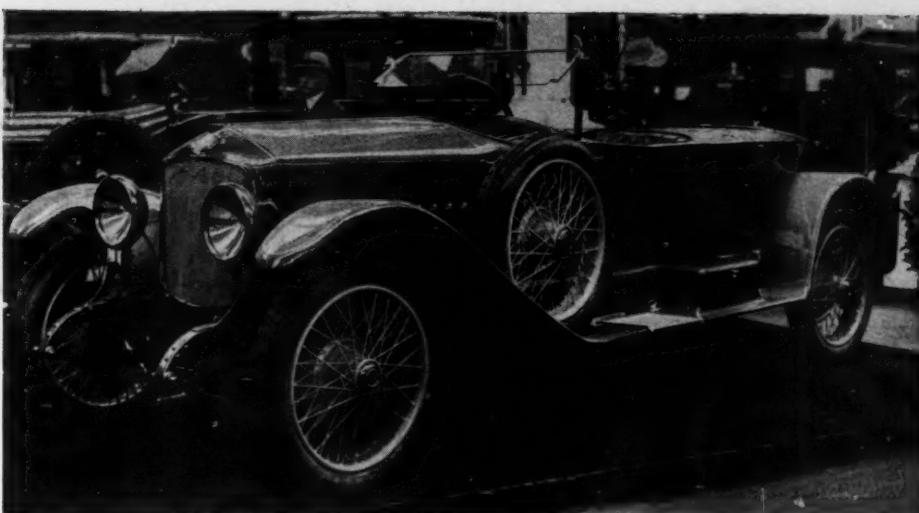
The dominating feature of this chassis, is the system of braking on all wheels, together with the cantilever suspension and attachment of the rear axle to the frame. Excelsior brakes operate diagonally by means of cables. One cable, for instance, is brought from the right hand front wheel over a double lever on the brake pedal shaft to the left hand rear wheel. In this way the effort applied to opposite wheels is always equal, and even if one cable should break, two wheels on opposite sides would hold and the car would not deviate from its straight course. Merely for holding the car when in a stationary position, there is a second control to the rear wheels by lever.

Metallurgique Chassis New

Metallurgique, while maintaining two smaller types, has produced an entirely new chassis with a four cylinder engine of 3.9 by 6.29 in. bore and stroke. It is understood that this engine will be replaced, at a later date, by a six cylinder of the same bore and stroke, mounted in the same chassis. Features of this new product are unit construction of engine and gearbox, with center control; brakes on all four wheels; cast aluminum dash and floor boards; a new forged full floating rear axle; and underslung semi-elliptic springs of exceptional length. Probably these are the longest springs ever fitted to a car, for with a width of 2.7 in. they have a length of 70 in. They are mounted under the axle and placed directly under the main frame members.

Other front wheel braking system seen at the show were Hispano-Suiza, Delage and Talbot-Barracq, all built on the Perrot license; the Bellanger, which has its steering pivots inside the brake drums; the Isotta-Fraschini, and the Excelsior. Other firms announcing front wheel brakes but not showing them on their chassis were Fonck, Spa, D'Aoust and Miesse. Some half dozen other Continental firms are known to be negotiating for Perrot licenses, but they have not yet made public announcements.

Miesse, one of the oldest of the Belgian firms, has two new engines, with respectively four and eight cylinders, of the same general design and the same bore and stroke. It is a growing practice, when adopting an eight ahead engine to make a four at the same time and of the same size. Miesse dimensions are 2.7 by 5.1 in., and for each type the cylinders are a block casting with de-



Three-passenger Excelsior which is featured with a one-piece running board, fenders, tool box and valance

tachable head and overhead camshaft, driven by a vertical shaft and bevel gearing inside the cylinder casting.

A rather unusual feature is that the steering gear housing is cast with the engine base chamber, being placed on the right forward arm, just below the magneto driven from the cross shaft.

A semi-racing type 3-litre engine is the feature of the D'Aoust production. This car was not shown complete, only the engine, clutch and gearbox unit being on exhibition. Cylinders are a block iron casting with detachable head, and an overhead camshaft in an aluminum housing. A vertical shaft at the front drives the camshaft which operates three valves per cylinder. This engine will, it is declared, be entered in the leading 193 cu. in. races of the year. In addition to this special sporting type D'Aoust has a medium size car on quite standard lines.

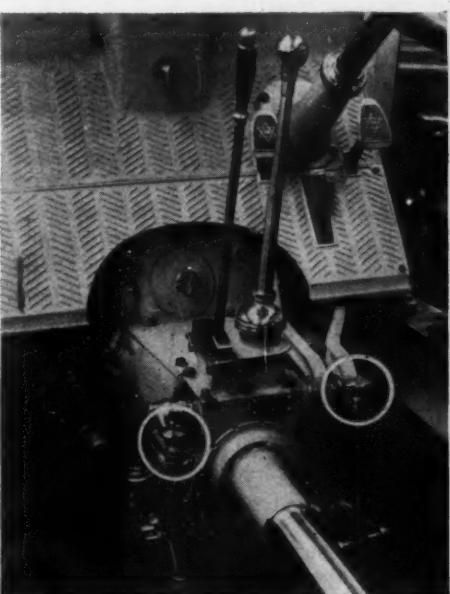
Belgian makers generally are paying

more attention to high class, almost luxury types, than to popular models. There is no firm with a program similar to that of Citroen in France or Bean in England. Somua has a popular type, but the firm does not have big production means. Practically the only other firm attempting to get into the popular class is Belga, a concern established since the war and marketing a light car.

High Grade Custom Bodies

Belgium had a high reputation, before the war, for custom bodies, and this has been maintained in the post-war products. Numbers of English chassis are sent across the Channel to be fitted with Belgian bodies, and this accounts for a greater predominance of English types than is seen elsewhere on the continent. This is particularly noticeable in all weather bodies, which are not much favored by Continental motorists, but are in great demand by English motorists. There is only a mild tendency towards the concealed top, and speaking generally it is only adopted for sporting type, two and three seaters. The Etablissements Generaux showed some very fine examples of running boards and tool boxes in a single stamping, thus avoiding the sharp angles which are unavoidable when the tool box is a separate construction placed on the running board. This firm showed running board, tool box, fenders and valance in one piece without any visible bolts and screws, this giving a very good effect on cars with rounded lines.

The Bosch magneto made its appearance in the show, being seen on two cars, one Belgian, the other Dutch. Bosch, however, did not have a stand. Switzerland came into the field as a magneto producer with the Scintilla. On this instrument the permanent magnet rotates, while the contact breaker, the windings and the condenser are fixed. The distributor is at the driving end of the magneto, thus allowing shorter wires to be used than when placed at the opposite, and outer end. A feature of the Scintilla is the ease with which it can be dismounted and assembled.



Gearbox layout on the Metallurgique. In the circle are shown the hand adjustments for the brakes, which can be adjusted while the car is in motion



A Department of BETTER BUSINESS

Conducted by Ray W. Sherman

Organize Club of Purchasers

If a dealer wishes to secure the maximum publicity for his cars and for his services he can do so by organizing a club of people who have purchased cars from him. Every owner of a car is a natural booster for that car and is interested in everyone else who drives the same make of a car. A club of folks who owned the same make of car would give all these folks a chance to get together and boost and would, of course, secure a lot of publicity in the newspapers.

It would augment the pride of the owners in their cars and make them urge other folks to become eligible for membership in the club by purchasing the same make of car. It might be possible for the dealer to work up a real organization with officers, constitution, etc., and it might be possible for this organization to stage picnics and drives, in which a good portion of the club membership would participate. All of this would tend to make these car owners stronger than ever for their particular make of cars and would tend to boost the dealer's sales of the cars very materially.

Issues Gasoline Books

The Holcomb Auto Supply Co., Hartford, Conn., does considerable business in the sale of gasoline books made up of coupons, one to a gallon, the books being of 100 and 300 gallons. The books are generally purchased by users of fleets of cars and trucks. The gasoline, by the way, is secured cheaper with the coupon books than in an ordinary transaction.

Showing Who Buyers of Cars Are

Every prominent person who has purchased a car from a dealer, is an advertisement for the car and a dealer and a splendid talking point when making another sale. But folks are very apt to forget names and, in a conversation not to be as deeply impressed with the importance of the names as they should be. Some dealers might find it a profitable thing to hang a list of "Some Recent Purchasers of Our Cars" in the salesroom and also to provide typed lists of these names which could be handed to prospects who give evidence

of being especially impressed by such a summary of local car purchasers. If recent sales have been slack then a complete list of car owners who have bought their cars from the dealer might be used, this list being alphabetically arranged and the address and occupation of each owner being given opposite his name.

Guessing Contest Means to Obtain Prospects

Prominently displayed in the show room of J. A. Cramer, distributor of Dodge Brothers' cars in Buffalo, is a huge map of the city, in which have been

A Bigger Market for Your Ideas

ONE idea in your own mind is one idea. That same idea given to 35,000 other men through the Better Business Department of Motor Age becomes 35,000 ideas.

Ideas help us all. They are the beginning of money-making plans. The smallest good thought may lead to a big result. Just as you are getting the good ideas of others through this department, give them a chance to get square with you by using one of yours. For the trouble of writing the idea Motor Age will send you ONE DOLLAR, and you have the satisfaction of having done the industry a service.

placed hundreds of red, yellow and green headed tacks. These tacks show the number of Dodge cars in use in Buffalo and where their owners live or have their places of business. The different colors indicate the different styles of cars; the red headed tacks, representing touring cars, predominate.

Over the map is a sign telling what the tacks represent and inviting the public to guess the number of tacks the map will show on the evening of the opening of the Buffalo automobile show Feb. 26.

The contest has been going on since Dec. 1. The sum of \$300 is to be divided among the winners as prizes.

While the plan, on the face of it, appears as a guessing contest and nothing more, it is serving admirably in bridging the sometimes awkward moment after the salesman presents himself to the prospect.

The canvasser is making use of it, too. After greeting the person he is calling on he asks if he has heard of the car guessing contest and on being answered in the negative pulls from his pocket a photograph of the map and hands the person a blank form on which his guess may be recorded.

The canvasser thus establishes a measure of acquaintance which permits him to ask whether the person might be interested in a Dodge car; and if the person isn't interested does he know of someone among his acquaintances who is. Often the canvasser or salesman, as the case may be, leaves the residence or office only to go back later and close a deal for a car. Still oftener he departs with the names and addresses in his note book of persons reasonably likely to develop into live prospects.

Special Used Car Sale Daily

H. B. Loveland of H. B. Loveland Motor Co., distributor of the Liberty car in Buffalo, is employing an idea that has resulted, he says, in the sale of a number of used cars this winter.

Prominently displayed outside in front of the show room is a blackboard on which are painted the words:

TO-DAY'S	
USED	CAR
	SPECIAL

Underneath is written with chalk the name and style of some used car and below an attractive figure at which it may be bought that day.

A Timely Reminder

Conlin & Green, Bridgeport, Conn., are boosting the sale of alcohol for anti-freezing purposes in a clever manner. They have a printed tag urging the use of alcohol which they attach to parcels leaving the store and also attach it to the steering wheels of cars parked in

the vicinity. The interesting feature of this card is the illustration of a thermometer with scales to show the percentage of alcohol required for any desired freezing point. For example, a glance at the card shows that to obtain a mixture that will not freeze until zero temperature is reached a mixture of 30 per cent alcohol and 70 per cent water is required.

The Sales Manager's Job

A successful sales manager should not only be as good a salesman as the best man on his staff but he should be a better one for the very good reason that frequently the best salesman gets up against a hard proposition and is unable to close. At such a time, especially when there is keen competition in which the competing house will make an especially attractive allowance on a used car every possible argument must be brought into play to secure the business. At this particular time when business is a bit slow there is all the more need for "super" closing ability. And this ability over and above the general average is largely governed on the ability of the sales manager to read human nature.

Advertises Through Service Cars

The service cars operated by many automobile dealers offer a splendid chance for advertising the excellent quality of the dealers' automobiles whenever the service cars are not called out for exceptionally long periods. For instance, suppose that an entire week elapses without a single call for the service car to go into the country and drag a machine out of the mud or bring in a car with a broken axle or something like that. In such a case the dealer might advertise like this:

"OUR SERVICE CAR IS GATHERING MORE DUST FROM DAY TO DAY."

"It is hardly ever in use.

"For the last week it hasn't moved out of the shop.

"There's a reason for this inactivity of our service car and the reason is that the cars we sell STAND UP!

"Let us show you how many car own-



A Salesroom Setting That Went Big

An advertising innovation that got results and one that can be copied in almost any part of the country recently was staged in Los Angeles by the Sudrow Motor Co. This company represents the Jackson car and by taking advantage of the name of the car to associate it with relics of former President Andrew Jackson a show was put on that was interesting and successful. As nearly as possible, the salesroom was made to depict the early home of the famous general. The floor was sprinkled with white sand. The offices were concealed behind a clapboard partition to which was affixed the coon skin and deer's head, such as were to be expected on the wall of Southern homes during that romantic period. From a great-grandson of General Jackson highly prized relics and souvenirs were borrowed and these were made the feature. The show was advertised and the newspapers sent out their feature writers to view the display. Of course, the relics were the big attraction, but the Jackson automobile was conspicuous and it received the attention of all who came

ers we have in this territory and how few calls we have for our service car. This is the best possible evidence that the automobiles we sell are superior."

Making Personal Friend of Customer

The establishment of warm, personal relations between the dealer and the car owners who patronize his establishment is one of the best ways of holding business and of bringing new business to the garage. When a car owner feels that the proprietor is a personal friend of his who is going out of his way to demonstrate this friendship by doing every-

thing possible in the way of service, then that car owner is going to spread the good news abroad and do his little bit to help the dealer get more business and make a bigger success of his enterprise. Every patron can be made into a strong booster.

Seek Farm Bureau for Prospects

A fine proposition for a dealer is to go to the farm bureau office of each county and get the names of each farmer who belongs to that particular bureau. In this way he will get a book full of prospects.—Archie R. Albro, Marathon, N. Y.

Give the Employees Used Cars Instead of Bonuses

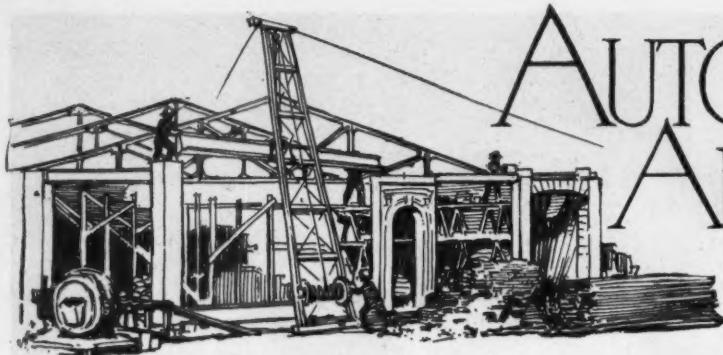
THE W. P. Herbert Co., Los Angeles, distributors for the Chandler and Cleveland cars in southern California, have put into effect a plan to solve the used car problem.

In lieu of the customary bonuses that this company pays its employees used cars valued at \$17,000 have been turned over to them for disposal. The value of the cars given the employees is equivalent to 5 per cent of the 1920 earnings of the salesmen and 10 per cent of the yearly salaries of the shop and accounting departments. Every member of the firm who had been connected with the company for three months or over shared in the distribution.

The idea of the company is to focus the interest of every employee on automobile selling. The proposition was made to them at a mass meeting and they became very enthusiastic. The company provides a salesroom for selling the bonus cars

without charge for rent. A committee has been named that has complete control of all plans and procedures. The committee employs salesmen and has complete jurisdiction over every detail. The operation is entirely independent in every way of all other lines of activity with the exception that the Herbert company will handle the paper when time sales are involved.

The cars comprising the "bonus" stock are selected by lot from the used car department. No executive of the company will have any part in conducting the sale. The effect of having an entire organization boosting heartily for a used car sale is expected to produce quick results in disposing of the stock of "bonus" cars and is bound to stimulate interest in problems of salesmanship. The project has got away with a good start and promises to benefit everyone concerned.



AUTOMOTIVE ARCHITECTURE

Planning and Building Problems



CONDUCTED BY TOM WILDER

Simplify the Plan Before Working in Details

For Car Storage Lay Out a Space 50 Ft. Wide With Aisle Through the Center Having Access to Street

No. 303

We have a lot 200 ft. by 150 ft. and want to build a garage 100 ft. by 150 ft. with space on each side. Cars will enter at one side and there will be no car entrance in front.—Zion Industries, O. B. Oas, Zion, Ill.

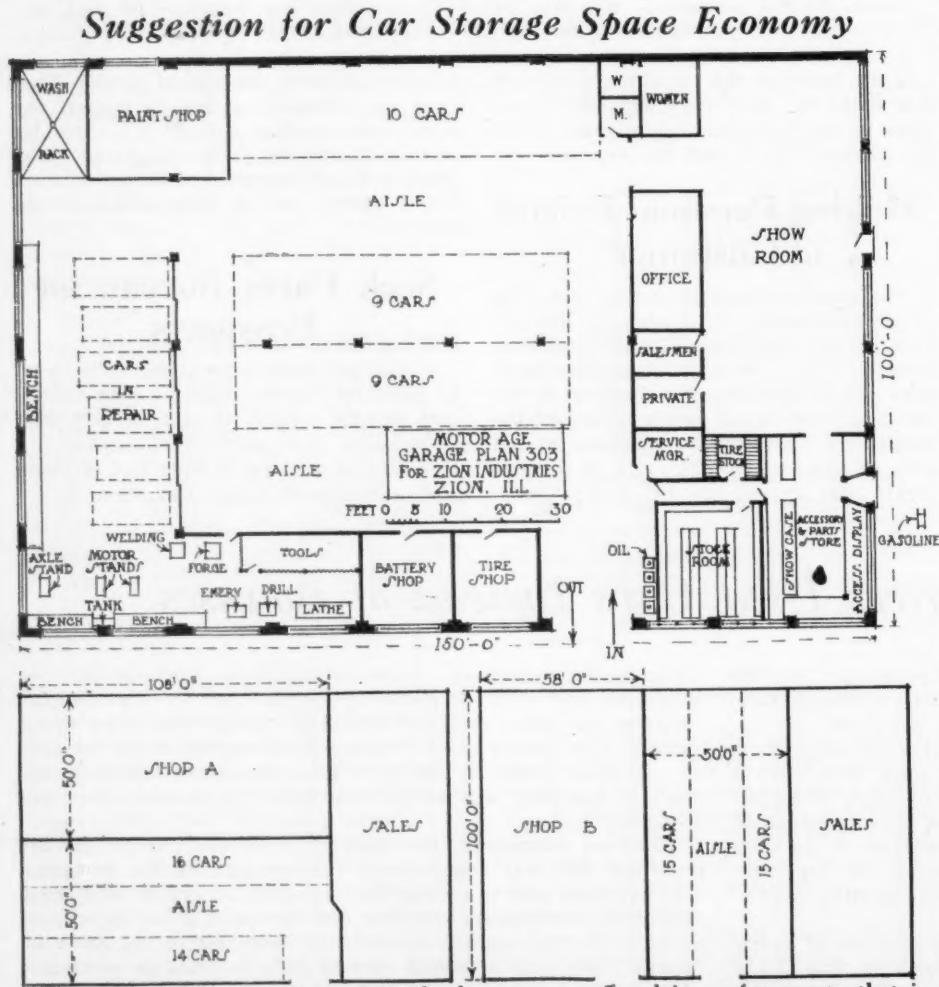
We have laid out this plan about as you requested. It has the advantage of having every department accessible, but has the disadvantage of being spread out in long narrow spaces that are not so usable as they would be if they were centralized and concentrated.

We added two half size outlines which have the same arrangement in front, but which separate the rear of the building into two distinct departments, the storage garage and the service station or repair shop. In the large layout there is 4070 sq. ft. of floor space devoted to shops, while in the small layouts shop A contains 5400 sq. ft. and shop B 5800 sq. ft. Since the car storage capacity of all three plans is the same, it is obvious that there is quite a lot of waste space in the large layout. This waste is mostly in the aisles which are greatly reduced in extent in the small layouts.

We would suggest that you study these small layouts and determine their possibilities before going ahead on the large one.

With the exception of the waste space your layout is very good. Your departments are all easily reached, cars are taken in and out of the repair shop and paint shop through the sliding doors without any difficulty whatever. If you transpose the position of the paint shop and wash rack an improvement will be effected. The washrack really belongs in the garage and the paint shop is a part of the repair department.

You will need a few sky lights distributed advantageously around the central part of the building as your windows are pretty well shut out by partitions.



No. 304

LIGHTING OF SERVICE STATION

We have a building lot 30 by 100 ft. deep on which we wish to build a service station. Please advise us as to the best method of lighting the building making allowance for a flat being added in the future. We wish you would give us the most economical and convenient location for the following: a washrake, stockroom, lavatory, and branches which will be located near the light.

What would you suggest for a roof so we could avoid using posts or steel

beams? This lot has no alley and we would have to have room left for light and ventilation in the rear. We were thinking of putting the heating plant in the rear using steam or hot water.—Bradford Automobile Co., Toledo, Ohio.

This shop could be perfectly lighted and ventilated if you don't intend to build a second floor, and as the full 100 ft. would be rather large for a flat we would advise carrying it only about 65 or 70 ft. back in order to get some skylights in the shop. The windows on the side next to the two story building will not give good working light and it will be a case of artificial light or resorting to some such scheme as suggested above.

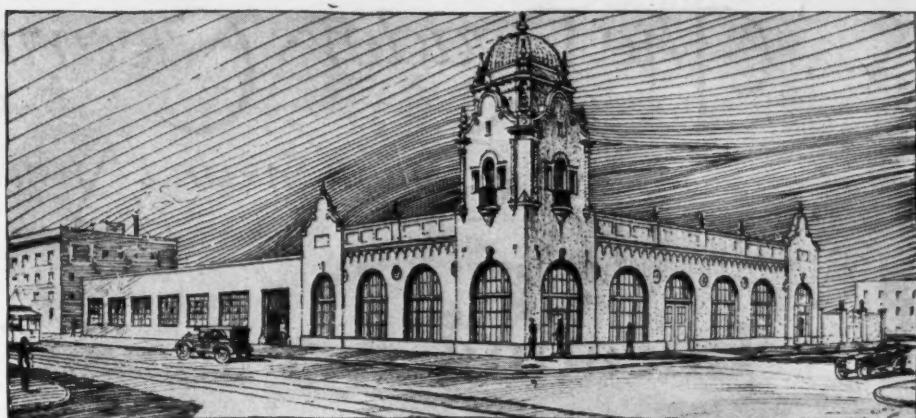
You will have to use posts or steel beams and built-up girders or heavy I beams if you support a second floor. The only alternative would be heavy trusses above the second floor ceiling to carry the roof with heavy rods passing down through the second story on which to hang the beams carrying the second floor. Your heating plant would seem more conveniently located in a cellar under the office and stockroom. The rear would prove inconvenient in getting back and forth with coal and ashes. Steam is preferable to hot water for garage heating.

Drain Trap for Garage Wash Racks

THE Lynn drain trap for use in garage wash racks will supply a long felt want. It is in reality a double trap as far as sediment is concerned, having a sediment deposit pot so placed that it catches all the dirt and holds all the grease on the surface of the water it contains. To empty this pot, thus cleaning the trap, one simply raises the perforated cover which swings on a hinge and then raises the pot which is also hinged and as it swings dumps the accumulated sediment on the floor. Below the dirt catching trap is another larger gas tight trap which will also catch some of the finer sediment that might pass the first.

The whole thing is heavily constructed of cast iron and is made in two sizes; No. 1 has 3 in. discharge and No. 3 has 4 in. discharge or double the capacity of No. 1. Nos. 2 and 4 are the same as Nos. 1 and 3 respectively, but have polished brass perforated cover plates.

When installed in a cement floor nothing shows but the cover plate and a narrow iron rim which forms a protection for the cement. The Lynn trap is



Attractive New Service Station in Spanish Colonial Style

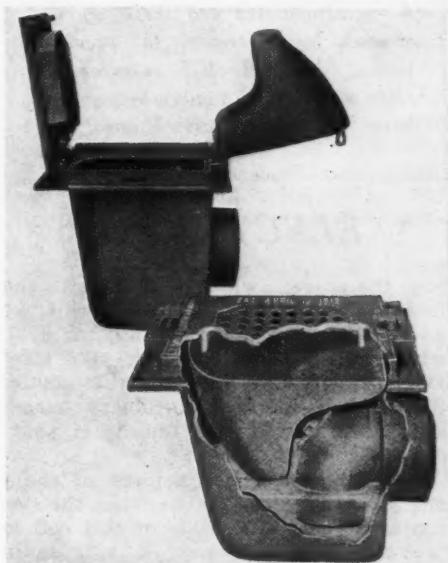
THE Vesper-Buick Auto Co., Buick distributor for St. Louis and surrounding territory, has purchased a prominent corner in the residential section of the city upon which it will erect a new Buick service station. Construction of the new building, a drawing of which is shown above, will begin immediately.

The new building will represent an outlay of approximately \$100,000.

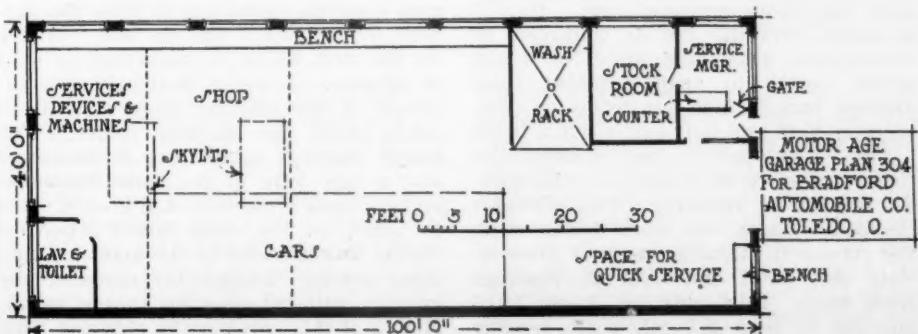
The style of architecture will be an adaptation of the Spanish colonial style. The exterior walls are to be covered with white stucco over brick, and all trimmings and finals are to be terra cotta. The tower on the corner will give the building distinction; its interior being illuminated by an arc light will make a pleasing effect at night and be an advertising feature.

The interior of the building is to have general offices, waiting rooms, all of which will be finished in tile and marble, and an immense parts department, which will be devoted exclusively to service for Buick owners. Shower baths and steel lockers will form part of the equipment for the men, while steel sash and skylights will furnish an abundance of daylight to the work benches.

The west part or front of the structure facing on West Pine Blvd. will be devoted to an oil station, and will be given over for public use, and for the use of owners calling for their finished cars. In all, the structure, its equipment, and arrangement is to be the latest for this type of building.



manufactured by the Central Foundry Co., 90 West Ave., New York.



No. 304—Service station on lot 40 ft. by 100 ft.

Automotive Architecture

IN this department MOTOR AGE aims to assist its readers in their problems of planning, building and equipping, service stations, garages, dealers' establishments, shops, filling stations, and in fact any buildings necessary to automotive activity.

When making requests for assistance please see that we have all the data necessary to an intelligent handling of the job. Among other things we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how large it is expected they will be.

Number of cars it is expected to garage.

Number of men employed in repair shop.

And how much of an accessory department is anticipated.

The Readers' Clearing House

Questions and Answers.

Locating Armature Troubles

Q—Explain how a growler used for testing armatures, works—i.e., what action has the current in the growler on the armature coils?

2—What action takes place when there is a short in the armature windings?

3—What action takes place when there is an open in the armature windings?

4—In testing an armature out of a Delco system on a Buick D 45 with a growler it was found that using a receiver connected in series with adjacent commutator segments, a very loud buzzing was heard at points A (in diagram) the buzzing diminishing until it was very faint at point B on the commutator. What caused the difference in the loud and faint buzzing sound?—Blake Hobart, Pemberville, Ohio.

1—The growler in simple form consists of the core made up of a bundle of iron wire, the ends of the core being bent in a horse shoe shape, and a coil wound on the core. This coil is connected to a source of alternating current. If the growler is passed over the winding of the armature or the armature is placed in the growler and revolved, and if the windings have no shorts the voltage set up in the coils by the action of the alternating flux of the growler would be equal in each half of the winding and would be opposed, thus the voltage would be equalized and no current would flow in the armature winding.

However, if the armature has a short circuited coil or section, the part of the winding so short circuited would form a local circuit and a heavy current would be set up in same by the alternating magnetic action of the growler. This short circuited condition would be indicated both by heating of the coils shorted and by the noise set up between the core and the core of the armature being tested, caused by the reaction of the alternating magnetic field of the growler and the magnetic field of the armature core, set up by the heavy current that is flowing through the short circuited section of the winding.

2—Refer to Fig. 1. All growers are about the same construction, but in order to make the case more specific we will outline the test that might be made with the growler manufactured by the Quality Electrical Products Co., Kansas City, Mo. Coil E has a short circuit in coil. Place armature on growler poles. This turns on the alternating current in growler coils. Pull bar A out as far as it will go, take testing bug and place it on core of armature. Turn armature slowly keeping bug on core. When slit containing coil E is brought under the

CONDUCTED BY ROY E. BERG

Technical Editor, Motor Age.

The Readers' Clearing House

THIS department is conducted to assist Dealers, Service Stations, Garagemen and their Mechanics in the solution of their repair and service problems.

In addressing this department readers are requested to give the firm name and address. Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been asked by someone else and these are answered by reference to previous issues. MOTOR AGE reserves the right to answer the query by personal letter or through these columns.

ELECTRICAL

bug, the current which is flowing in the local circuit former in coil E will set up an alternating magnetic flux, or field, which will attract and repel the steel vibrator piece B in cut 3 with the results that it will act as an ordinary buzzer and indicate that coil in slit is short circuited.

Mark this slot with a piece of chalk and proceed with the test. When the slot containing the other side of this coil is brought under the bug, it will again vibrate and you will know the coil in slot is short circuited. If these two slots are the only ones in core to make the bug vibrate, you will know that you have only one short circuited coil. To tell in which bars this coil is connected to commutator, take hand piece No. 2 and adjust points to span adjacent commutator bars. Place test points on commutator bars and pull bar A out a little.

Now with points on commutator, rotate armature until you have the highest reading on ammeter. This indicates the point where coil being tested is in the strongest magnetic field of growler. Note this point and take all readings from same. Now pull bar A out until you get at least 2/3 full scale reading and rotate armature taking reading of

each pair of bars. When you get to bars 9 and 10 your reading will be low, and will depend on how many of the turns are short circuited. Thus if the coil has ten turns and other coils have a reading of 100 points on meter, a reading of 65 would indicate that about one-third of the turns of coil E are short circuited.

3—Coil C has a wire broken and is open circuited. Bug test clear, when points are put on bars 3 and 4 the reading will be zero, indicating in this case an open circuit.

4—It is evident that there must have been some current flowing in the coil which might indicate a minor short. If at any time you wish to make a test between adjacent commutator bars we advise soldering some connections and passing current into the armature. You can then use a milli-voltmeter to obtain an accurate reading of the drop between adjacent segments.

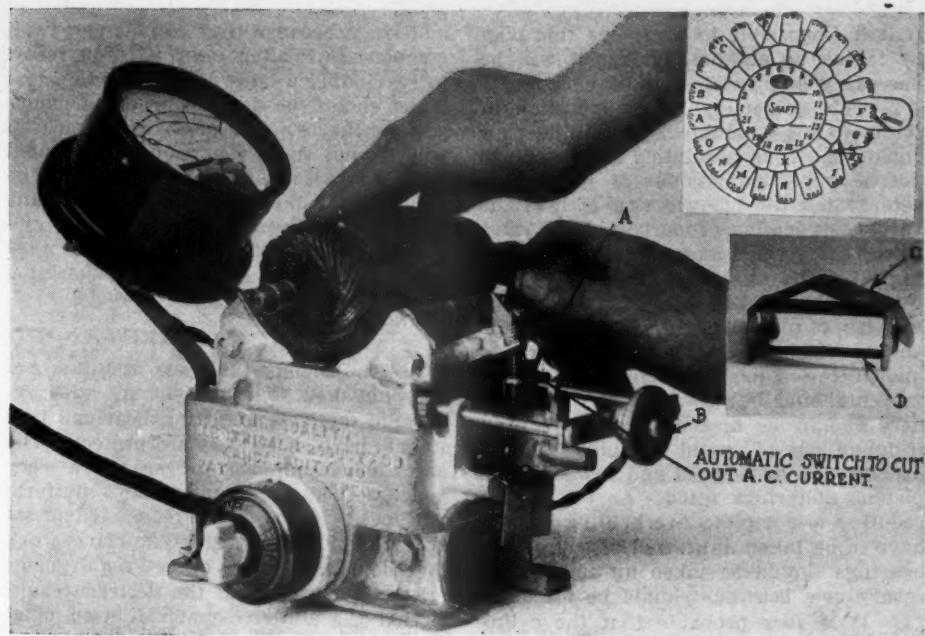
1916 ELGIN WIRING DIAGRAM

Q—Publish wiring diagram of the 1916 Elgin, showing method of installing ammeter.

2—Will any particular kind of ammeter need to be used? Will any changes need to be made in the Dyneto generator?

3—How much compression was this (Falls) motor designed for?—D. E. Rose, Farnhamville, Iowa.

1—We believe that the easiest method to install an ammeter on this wiring will be insert a meter of the dead beat type which is designed for the purpose of taking very heavy overloads, will be the proper meter to use. A meter of this kind is built so that it will pass the heavy starting currents for starting motors which amount to about 400 amperes, without injury to the meter. As soon as the heavy current has ceased passing through the meter the light current from the generator or from the battery if the lights are on will register on the dial which is calibrated to read to 30 amp. A meter of this kind is inserted in the starting motor circuit in series with the starting motor. The heavy starting cables are disconnected and a new wire of the same thickness and the same cross sectional area is fitted to reach to the dash board where it should be connected to the ammeter, and after passing through the ammeter the current will continue on to the motor. Meters of this sort may be obtained from the Roller Smith Co., Woolworth Bldg.,



Tracing Armature Short Circuit With a Growler

Fig. 1—A diagram showing the armature coil indicating certain troubles existing in the armature is shown in the upper right hand corner

New York, or the Hoyt Electrical Instrument Works, Penacook, N. H.

2—See above answer. No change will be necessary in the generator.

3—Approximately 70 lb. per sq. in.

STORAGE BATTERY FAILS TO CHARGE

Q—Explain why a storage battery does not charge when the generator is known to be generating properly. Question refers to a Sims-Huff system used in a Maxwell car.—D. C. Zahr, Ingalls, Mich.

There are a number of reasons why a storage battery will not charge when the generator is producing current. The battery might be a probable source of trouble. Often circuits in the wiring from the generator to the ammeter to the starting switch and to the battery

would also cause the same condition.

If the trouble is in the battery it is probable that a high resistance is the cause. The plates might be sulphated and the battery generally depreciated. Perhaps the terminals are corroded so badly that the current passes with difficulty, in which event, the generator will not charge the cells.

The electrical system of this car demands that there be a counter electromotive force opposing the generator voltage in order that the system may function properly. In fact, practically any electrical system operates in this manner.

We suggest that the battery be tested as well as all connections between the battery and generator.

ENGINES

CAMSHAFT KNOCK

Q—A Buick H 45 has a knock at cam-shaft speed. It can be heard every time number twelve valve opens. Have examined valves and push-rods but they seem all right. Believe it to be a rear cam-shaft bearing. What is your opinion?

2—Advise how to remove engine from frame and each operation step by step necessary to dismount engine to get at rear cam-shaft bearing of H 45 Buick.

3—Instruct how to adjust rear end assembly of Maxwell 25, 1919, which has quite a lot of back-lash which causes the car to jerk when in high speed at 10 miles an hour or less.—Emil A. Pepin, Woonsocket, R. I.

1—We would advise that the pump shaft be examined as we have found that many half time knocks may be found here. If it is not the pump shaft and is found to be in the cam-shaft as you now suspect, the cam-shaft will have to be removed and a tubular bearing fitted

in its place. This is done by removing the radiator and the front timing gear cover of the engine. The valve tappets should be lifted free of the cam-shaft, and the cam-shaft may be then pulled out the front of the engine. The old bearing is first removed by pressing it from the bearing cap and the new is pressed in.

2—It is not necessary to remove the engine from the frame to get at the rear cam-shaft bearing as is explained above.

3—The backlash which you describe here might not necessarily be in the rear axle. Because of the fact that a torque tube is employed on this car it is very hard to determine exactly where the trouble is from a mere superficial examination. If there is any backlash it will be found in any of the following places

or each place may be contributing slightly to the cause; the universal joint, the splined connection leading into the universal joint, the pinion gear connection to the shaft, the improper adjustment of the pinion and ring gear, the differential connection to the drive shafts and the shaft connection to the wheel hub. In all likelihood the trouble will be found in an improper adjustment of the gears in the axle.

Very probably there is no backlash, and the jerking action which you describe will be found in the ignition system. A missing spark will oftentimes cause a car to jerk at slow speeds. Perhaps the ignition might be too far advanced in the retard position which would also cause the same condition.

CALCULATING ENGINE SPEED

Q—Please explain how to find revolutions per minute of the various engines.

2—Is there any formula for this or does it have to be found by dynamometer test?—A Reader, Pontiac, Mich.

1—The r.p.m. of an engine is most conveniently measured with the use of a speed counter. This is a small instrument that is pressed against the engine shaft and by means of a worm and worm wheel, the revolutions are read from the graduated dial.

A tachometer is an instrument also used to measure engine speed. An instrument of this type indicates the speed continuously while the engine is in operation.

2—The speed of an engine may be calculated from the speedometer of a car by determining the relation between the miles per hour and the engine revolutions. This is done as follows:

Where You Will Find the Answer to Your Inquiry

To assist readers in obtaining as a unit all information on a certain subject, MOTOR AGE segregates inquiries in this department into divisions of allied nature. Questions pertaining to engines are answered under that head and so on.

Electrical

Blake Hobart.....Pemberton, Ohio
D. E. Rose.....Farnhamville, Iowa
D. C. Zahr.....Ingalls, Mich.

Engines

Emil A. Pepin.....Woonsocket, R. I.
Westley Lau.....Klemme, Iowa
The Automobile Co., R. S. Mooney,
Manager.....Trichinopoly, India
T. J. Agnew.....Sioux Rapids, Iowa

Carburetors

R. Sagl.....Schnidon, Wyo.

Transmissions, Axles, etc.

Joe Liken.....Detroit, Mich.
C. E. Myers.....Portland, Ore.

Transmissions, Rear Axles, etc.

Michell D.....Waterbury, Conn.
Modern Welding & Machine Co.....Terre Haute, Ind.

Assume that the car is traveling 20 miles per hour; that it is fitted with 32 by 4 tires and has a rear axle ratio of 4.5 to 1. The wheel, being 32 inches in diameter, will have a circumference of 100.6 inches or 8.38 ft. Since there are 5280 ft. in a mile and since the car is traveling 20 miles per hour, the rear wheel will make 1262 revolutions in the 20 miles. The rear axle ratio being 4.5 to 1 means the engine is traveling 4.5 times as fast as the rear wheels; accordingly, its speed is 5660 revolutions per hour. This figure, divided by 60 gives the r. p. m. as 945. A constant may be calculated here which, when multiplied by the speedometer reading, will give the engine r. p. m. In our particular case the constant is 47.25.

OIL PUMP LOSES PRIME

Q—The oil pump on a 1917 Oakland Six model 34 loses its prime and stops pumping oil while the engine is running. A new pump plunger and valves did not remedy the trouble. Can you suggest a way out of this trouble?—Westley Lau, Klemme, Iowa.

The type of pump used operated from the camshaft and the return of the plunger is dependent upon a spring. It is possible that this spring is very weak or perhaps broken. We advise that you examine this spring and if necessary provide one of greater strength. A good way to try the pump is to drive it very slow by hand and if it pumps oil and the valves seat correctly it is very probable that the spring is too weak to give a good return when the pump is being driven at high speeds. If the pipes have not been thoroughly cleaned there is a possibility that dirt is preventing the oil from getting to the pump and probably interfering with the seating of the valves in the pump.

INCREASING MILEAGE

Q—The Flanders twenty car is fitted with a carburetor without a name—looks like a Schebler. Would like to get more mileage from it as at present it gives only 15 to 18 miles per gallon. Would a present day carburetor with hot spot give any improvement?—The Automobile Co., R. S. Money, Manager, Trichinopoly, India.

The Flanders car is slightly out of date and, therefore, it is proper to assume that the most efficient results are not being obtained with the old style carburetor as fitted. However, 15 to 18 miles per gallon is very good and we feel that the improvement obtained by installing hot spots and up-to-date carburetors would not be commensurate with the cost of the equipment.

ENGINE REQUIRES OVERHAULING

Q—How can $\frac{1}{4}$ -in. end play in the crankshaft of a model 45 A 1917 eight-cylinder Oldsmobile be taken up?

2—The engine does not run well. It leaks compression, throws oil and carbon up. The valves are in good shape. When the carburetor is adjusted for low speed it is too rich for high speed. When set right for high speed the engine will not throttle down without jerking. Would light-weight grey iron pistons help? What kind of rings should be used?

3—Car has been run 25,000 miles. Would the cylinders wear oval in that time and how can I detect the wear? If they are oval what must be done? Can the cylinders be ground with old Lynite pistons?—T. J. Agnew, Sioux Rapids, Iowa.

1—End play in the crankshaft is probably due to badly worn main bearings.

If it is impossible to overcome this play by taking up on the bearings it will be necessary to provide new bearings.

2—This extremely poor operation of the engine is undoubtedly due to its poor condition. It is absolutely impossible to get a proper adjustment of the carburetor when the compression is low, the valves not seating properly and the valve stems badly worn and the pistons pumping oil.

To overcome this condition it will be necessary to thoroughly overhaul the engine. The valves should be reground and if the stems are badly worn new valves should be ground in. The cylinders should be measured carefully and if found out of round the block should be reground or rebored and new oversize pistons and rings fitted. As the engine requires a complete overhauling it will have to be taken down and of course the bearings should be taken up and if necessary new bearings should be fitted.

3—It is very probable that the cylinders are worn oval after the car has run this far. The only way to determine the amount of wear is to caliper the bore of the cylinder very carefully. In cases where the cylinder is worn oval shaped it is not advisable to lapp in new pistons

and rings because they cannot very well compensate for the wear. If you resort to regrinding a large heavy grinding machine should be used in order to insure getting the cylinder perfectly round. If you do not have the proper equipment for doing a job of this kind it is advisable to send the block to some company that makes a business of regrinding cylinders and fitting new pistons as they are in a position to do a good job at a very reasonable rate.

LAPPING IN BEARINGS

In the December 16 issue of MOTOR AGE we published some statements with regard to methods of fitting bearings that might have been misinterpreted. The so-called lapping-in process is a very good method of producing two uniform surfaces. In cases where a hard metal surface and a soft metal surface work together, the only other requirement other than producing the desired result, is that the abrasive material used must do no harm in any way. At the present time the lapping-in method is being used by many large automotive concerns not only because it requires less time but because better results can be obtained in this short period.

CARBURETERS

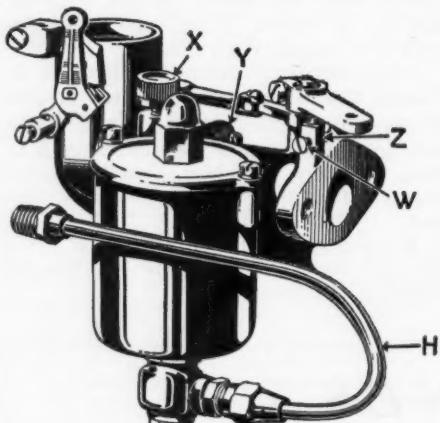


Fig. 2—L. F. Stromberg carburetor for Ford cars showing points for adjustment

STROMBERG ADJUSTMENTS

Q—How do you adjust a model L. F. Stromberg carburetor for a Ford? We find it necessary to screw the air all the way down to keep the engine from backfiring when the throttle is opened quickly. The engine seems to run better when the valve in the float chamber is opened widely and the gasoline runs out of the top of the bowl.—R. Sagl, Schnidon, Wyo.

The final adjustment of the carburetor which should not be made until the engine is thoroughly warmed up to its normal temperature may be effected as follows: First, gradually close the throttle with a medium retarded spark until the engine slows down to a low idling speed. At this time the throttle stop Z, Fig. 2, should be touching the top screw W. This screw can be regulated to obtain the desired low engine speed by

screwing it out if the engine is running too fast, and in if there is a tendency for the engine to stop.

It does not, however, control the mixture adjustment in any way. If the engine does not hit evenly under this adjustment for low speed or idling, turn low speed adjustment nut Y in or out until the desired results are obtained. The low speed and high speed adjustments are independent of each other.

To make the final high speed adjustment, open the throttle lever on the quadrant about 1 in., and advance the spark to its regular running position. Then, if the engine is hitting unevenly, turn the high speed screw X right or left one notch at a time, until it is hitting evenly. The correct position will be found by a few trials. In order to effect the most economical adjustment the needle controlled by screw X should be opened (anti-clock-wise) until the engine begins to slow down or run irregularly. Then turn back two or three notches.

If an entirely new adjustment of the carburetor is necessary, place the throttle in wide open position and screw the high speed adjusting nut to the right until it becomes tight. Then with the throttle lever in the same position turn the nut to the left twelve notches or 1-1/2 turn and this will give you the temporary adjustment for the high speed range. Next the low speed adjustment must be screwed in as far as it will go and then opened 1-1/2 turn. The adjustment you will then have will be approximately correct and the engine will be ready for starting.

Transmissions, Rear Axles, Etc.

INTERNATIONAL TRUCK AXLE ADJUSTMENT

Q—What causes a pronounced hum in a 1917 International 1-ton truck? Apparently, it comes from the differential on a hard pull, and disappears when coasting.

2—Explain how the governor works on this model.

3—Give the gear ratio on all speeds.

4—State gear ratio on a 1920 Maxwell 1½-ton truck.—Joe Liken, Detroit.

1—The humming noise which is pres-

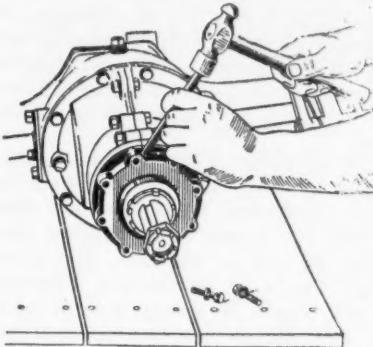


Fig. 3—Adjusting large bevel gear by removing side plate and gently driving adjusting ring around with a hammer and a piece of brass

ent when accelerating or when the truck is under a heavy pull is probably due to the gears meshing too tightly or too deeply. It would be advisable to readjust the gears as this might overcome the trouble. The entire gearing can be taken out without altering its adjustment as directed below, but adjustment can be made with the gearing in place.

Refer to Fig. 3. To adjust gears remove shaft packing plate (7130H) and back off lock screw (7148H) on each side of the differential housing. The adjusting ring (7140H) is then accessible through openings in the housing. These rings adjust the bevel gear sidewise, and take up any play in the thrust bearings.

Refer to Fig. 4, the bevel drive pinion is adjusted by 7145H. Remove the cap screws locking this piece. To back the pinion out, turn 7156H to the right.

Refer to Fig. 5. To force it in, turn to the left; this screws 7145H back on 7016HA. Put the lock screws back in and draw up, forcing the pinion and bearing assembly forward. There are three tapped holes close together for each screw so that a close adjustment can be made. Pull 7145H hard against the case with the lock screws.

The best way to determine whether the adjustment is perfect is to cover the teeth of one gear with a light coating of Prussian blue and then, after assembling, turn the gears a few revolutions. When the blue is transferred to the other gear uniformly, from end to end of the teeth, the adjustment is right.

Be careful to have the adjustments securely locked before finally assembling and be particularly careful that there is

no pressure exerted by the adjusting nuts on the thrust bearings. If there is, you may have to take the axle down again shortly and put in new bearings.

Notched nut (7014HA) adjusts the thrust bearings only.

While an experienced man can adjust the gearing without removing it, it is much more readily done by getting it

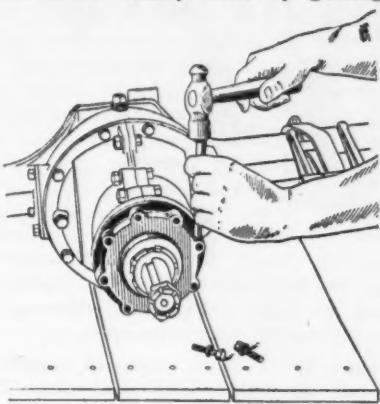


Fig. 4—Adjustment of bevel pinion. Tapping the ring in right hand rotation backs bevel pinion out and into looser mesh with bevel gear

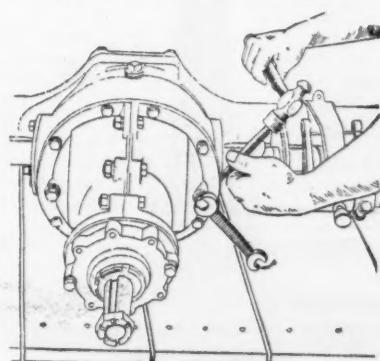


Fig. 5—Forcing bevel pinion in by rotating adjusting ring in the left hand direction

out where it can be seen. To do this, jack up the axle, remove the wheels, remove the bolts fastening bearing retainer

(7129H) to brake anchor and pull out drive pinion and shaft. Unbolt the gear carrier (7004HA) from the housing when the carrier with the assembly gears can be pulled forward. Do not remove bolts holding the housing to the axle.

In replacing the wheels, screw the axle nut up hard and lock with cotter. This does not apply to old style axles.

2—The centrifugal governor shown in Fig. 6 is carried at the front end of the crankshaft and acts directly upon a sliding sleeve, which moves one end of a pivoted lever, to the other end of which is attached a rod working in a tubular casing and operating the governor throttle. A spring working with the rod and accessible through a cover directly under the magneto allows slight adjustments of speed. The seals are provided so that the governor cannot be tampered with by any unauthorized parties.

3—The transmission gear ratios are as follows: First speed, 3.22, second speed 1.55, third speed 1., reverse 4.31. The total gear reduction of the rear axle is 7.91.

4—The total gear reduction is 7.25.

FLAME FOR RADIATOR REPAIR

Q—Can you give a good substitute for city gas for radiator repairing?—A Reader, Atlanta, Ga.

Since city gas is not available and the welding flame is too hot it would be advisable to use a blow torch that will give a fine needle flame and also the ordinary broad flame. We believe that a torch such as the one manufactured by the Otto Bernz Co., 17 Ashland St., Newark, N. J., will prove satisfactory for this purpose.

BEVEL GEAR RATIO

Q—What should be the diameter of a bevel gear to obtain a ratio of 54 to 1? I want to drive the big gear and have the pinion driven.—E. C. Myers, Portland, Oregon.

There is an insufficient amount of information given here from which a gear of this kind may be calculated. Provided that the use of gears was known we might decide just what size teeth to cut on the gear blanks, which then would give a means of knowing what the diameters of the gears would be. This problem is one that is slightly out of ordinary consideration, for a stepped up ratio of 54 to 1 is rarely met.

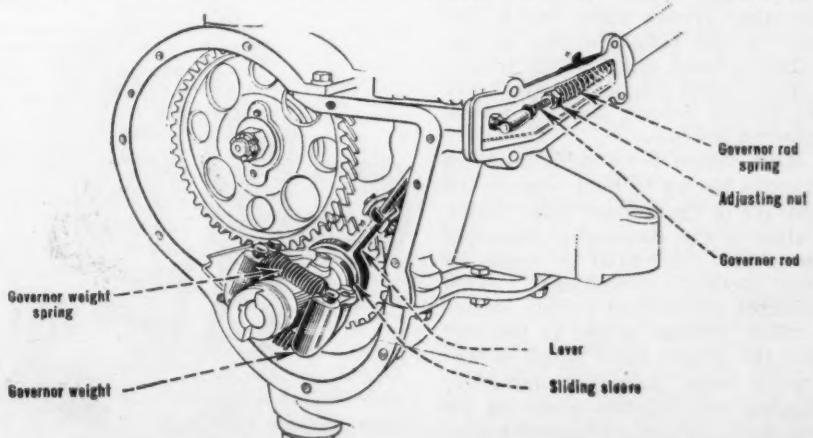


Fig. 6—Diagram showing the construction of the centrifugal governor showing the various parts and points of adjustment

It is possible that such a large increase in ratio could not be accomplished with ordinary gears for some purposes. For example, if the gears were of any considerable size, that is having to transmit rather considerable powers, the friction might be so great that it would be impossible to drive the pinion gear. However were the gears small and finely cut, similar to the gears in a milk separator it would be possible to step the small gear up to this speed. It should be remembered that with a gear ratio of 54 to 1, 60 r.p.m. of the drive gear will mean over 3000 r.p.m. on the driven gear.

VELIE CLUTCH ADJUSTMENT

Q—Give details of the Miller differential.

2—How can clutch on Velie 1915 be made to disengage fully?—Mitchell D., Waterbury, Conn.

1—In the Miller differential proper there are four units: A driving plate; two groove blocks and eight steel balls through which the power is transmitted. When the car is running on a straightaway, the entire differential consisting of the parts named revolves as a unit just as in a conventional type differential. When variable speeds of the driving wheels are desired such speed variations are made possible by a changing of the positions of the driving balls in relation to the driving plate and the groove blocks.

In other words if the Dorr Miller differential was mounted in a driving axle with only the part as described, the action of the rear axle would be identical with that of any other driving axle carrying a conventional differential. The Miller differential has two cast iron friction plates which are applied against the outside surfaces of either groove block. These plates when in action provide a simple collar bearing between the alloy steel outer surface of the groove blocks and the cast iron inner surface of the friction plates themselves.

These friction plates are so assembled that they permit differentiating action when making turns under normal conditions but the value of the friction retardation does not become apparent until one wheel or the other begins to spin or skid. Just as soon as the skidding or spinning starts, that is, just as soon as one groove plate tries to move faster than the other groove plate, due to the difference in the road traction of the wheels, that groove plate which is trying to move faster tends to move away from the central driving plate by means of its tapered grooves.

This effort causes the outside surfaces of the groove blocks to bind against the inside surface of the friction plate, which is held rigid in the differential assembly and causes the differential to cease its differential action automatically. This retardation of differential action, erroneously called locking, is due to the fact that when the groove plate which is trying to move faster than its companion, binds against the friction plate on its side, it causes a reactive pressure transmitted through the groove and the plates to bind the opposite groove block against its friction plate, in this way forming

external and disassembled view of the transmission is shown in Fig. 9.

2—A sectional view of the clutch is shown in Fig. 7. The friction bearing material between the four metal surfaces of the clutch is Raybestos. If the disks are badly worn or burnt it will be necessary to install new ones. If, however, it is simply a case of the fabric becoming packed down adjustment of the clutch can be made as follows: First, loosen slot bolts and shift them clockwise about 1-2 in. Let the clutch in and if the opening between the throwout and the clutch brake leather is less than 1-2 in., throw out the clutch and tap the slot bolts back counter clockwise far enough to increase this space to a full 1-2 in. Second, the adjustment of the slot bolts must be used to increase or decrease the movement of the clutch, as too small a movement will make the clutch drag, and prevent a clean release.

Third, if bolts X426 adjust against rear end of cover slots, screw them out of their mounting holes and set them back into the repeat holes exposed near the opposite end of the slots, thus doubling the range of adjustment. Fourth, if for any reason the clutch is to be taken apart, first punch remounting and line up marks on the cover and casing, as clutch will not work properly if the cover is shifted in remounting. In removing the clutch, first release the clutch and insert a spacer between the throw out yoke and clutch cover. The Raybestos rings should operate freely, and not be secured in any way to the metal parts.

MAXWELL REAR AXLE ADJUSTMENT

Q—Publish adjustment of the Maxwell 25-16 and 18 rear axle.

2—Is it possible to use shims for thrust bearings, and will they be of any particular benefit?—Modern Welding & Machine Co., Terre Haute, Ind.

1—The adjustment of the ring gear and pinion on the axle of the car is accomplished by moving the ring gear laterally and the pinion gear fore and aft. The gears may be moved by inserting shims at the positions noted in Fig. 8.

The proper adjustment of the gears will be obtained when the back-face of the bevelled section lines up.

Another way to check the adjustment is to run a piece of wrapping paper of seven to eight thousands of an inch in thickness through the gears. If the paper is crimped to conform to the teeth without tearing or injuring the fibre, then the adjustment is properly made.

2—Same as above.

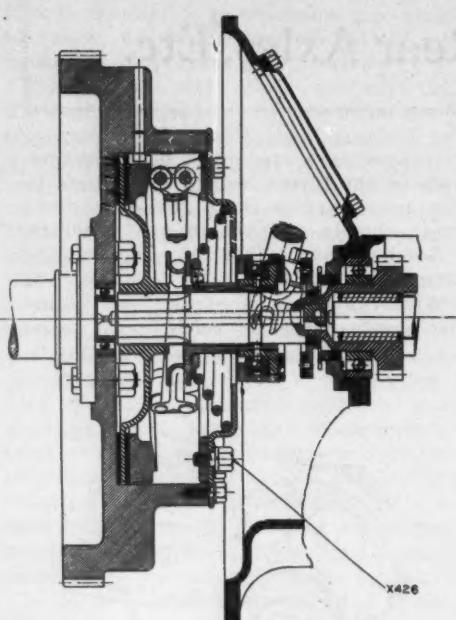


Fig. 7—Sectional view of the clutch used on the 1915 Velie showing points of adjustment

substantially a solid unit of moving parts of the differential and virtually compels the differential to transmit equal power to both rear wheels. An

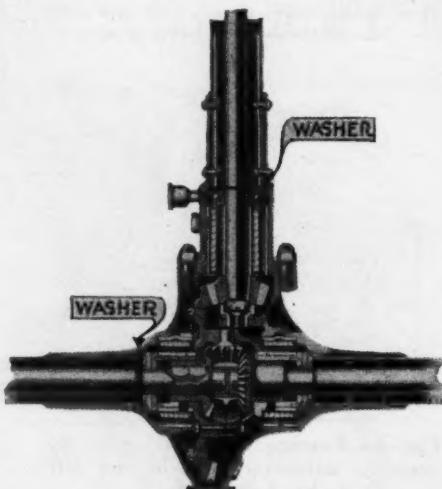


Fig. 8—Rear axle used on 1918 Maxwell showing places where shims may be fitted for gear adjustment

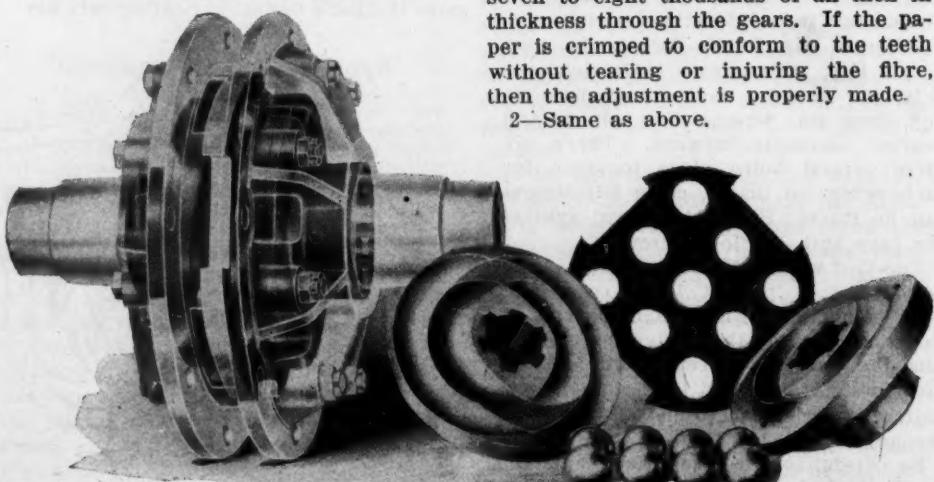


Fig. 9—Disassembled view of Dorr-Miller differential

IN THE PAINT DEPARTMENT

Getting Started in the Automobile Painting Business

(1)—Kindly give me some information as to how to get started in the automobile painting business.

(2)—Also please advise where I could obtain an air spray outfit and the best kind of paint to use.—Aubrey Phelps, Gleason, Tenn.

(1)—The matter of advising you about how to get started in the automobile painting business is rather difficult, as you do not state what experience you have had with this sort of work. If you are an experienced painter of automobiles we would suggest your renting a room large enough to take care of your requirements for brush-work, and then add your spraying equipment as you become better acquainted with the demands of your trade. You can also add facilities for dipping or flowing the stripped parts, and if you care to install an oven you can duplicate the fine baked-on finishes that come through on these parts from the factories. Baked-on enamel finishes are the hardest and most durable that can be produced, and well suited for the rough treatment and exposure that the fenders, splashes, hood, etc., receive. Wire wheels can be sprayed and baked and very satisfactory finishes obtained.

If you are not an experienced painter we would not advise your attempting the work of painting automobiles without some previous schooling, as the work must be scientifically done in order to produce good results. Once you have acquired the "know how" you will not find it difficult to produce the finest of finishes and obtain plenty of business at good prices, but a thorough knowledge of the trade is the only avenue to success. The quickest way of obtaining this schooling is from some institution that teaches the work, and you can also acquire it by serving an apprenticeship in some established shop which is by far the more tedious and long-drawn-out method, especially if you want to get started in business for yourself.

(2)—Spray outfits, air compressors, etc., can be had from The DeVilbiss Mfg. Co., of Toledo, Ohio, or from the Paasche Air Brush Co., Chicago. If you have an air compressor you can purchase the spray-gun and its accessories separately; if not complete equipment must be obtained as compressed air is necessary in the operation of the spray. Any of the materials used for painting automobiles can be suitably sprayed, but it is not satisfactory to spray finishing varnish on the body panels, etc., on account of the danger from "runs." Chassis finishing varnishes can be satisfactorily sprayed on the chassis, however, and the heavy bodied spar varnishes can be so applied to the wheels.

In working with a spray in a closed room some means of ventilation must be provided so that the air does not become

heavily charged with the paint, and again you must provide adequate protection for the surrounding cars and walls. Spray-booths containing a ventilating fan can be had for this purpose from the above manufacturers, or some sort of a home-made affair can be improvised.

The upholstery must be protected from the spray of paint, and in doing a two-color job you will probably find it easier to spray the chassis and stripped parts, and do the work on the body panels and wheels with a brush after you begin with the application of the color coats. For instance, if you were going to paint a sedan with color and black, the panels of the top as well as the chassis and most of the stripped parts would be finished in black while the panels of the

body and the wheels would be finished in color. To apply these different colors to the different surfaces with a spray would be rather awkward without soiling and it is for this reason that the work is best divided as mentioned above. Where the entire job is to be painted one color this difficulty is not encountered.

The materials can be applied to the chassis with the spray much more thoroughly than with the brush, and this method of painting it is a most excellent one. It can also be cleaned with the spray by first dusting it off with the compressed air, and then spraying a cleaning solution onto it that is suited to the requirements of the work to be done.

Any of the automobile painting materials that can be applied with a brush can also be used in the spray-gun, but for the reasons stated above it is better to apply the finishing coat of varnish on the body panels, etc., with the brush. Trucks, tractors and farm implements can be quickly and cheaply painted with the spray.

Varnish Coats Free From Specks

Q—I was much interested in your article in Motor Age on painting automobiles, and quite agree with you that there is a big field everywhere for that line of work, which, as you intimate, isn't difficult once you know the work fairly well. The average automobile of standard make will outwear several bodies and tops, but the usual practice is to turn them off when the body and top gets a bit shabby, whereas if painted or even rubbed down and revarnished and a new top put on the machine will look almost as good as new, and for all practical purposes is so.

I have had a little experience in refinishing automobiles and have always had one great difficulty, that is to getting on the varnish so that it will leave a smooth job free from specks. I have never been able to do this for some reason. Don't have any trouble about leaving brush marks, but in spite of any kind of brush so far used or any method of cleaning a varnish brush, whether new or old, or regardless of care in putting the varnish into a perfectly clean can before starting work there are the specks, like fine grains of dust. I can do a job on a piece of inside woodwork in my house without a speck being seen but they show up on black work, especially on fenders and hoods.

It has been my practice before laying on the varnish or finishing coat to thoroughly wet down the cement garage floor, sprinkle thoroughly outside the doors and then close them so no trouble with dust coming in. I also go over the body and wheels with a damp chamois cloth so that not a particle of dust is on the job. The specks seem to be in either the varnish or the brush.

I would also like to know just what process to use on simply revarnishing a car when the finish has become dull. What to use to rub it down, how much of the finish to remove, etc. Whether to use pumice stone or finest sandpaper and what to use in applying the pumice stone if that is best.—C. R. Tinan, Kimball, S. D.

Speckless varnish coats depend largely on having clean surfaces to varnish. You state that you wipe off the surface with a wet chamois before varnishing in order to remove any dust. This is probably the source of your trouble, for a chamois

will give off a lint and this will be picked up by the varnish brush.

Strain the varnish through cambric, and then if your brushes are clean the following procedure will remedy your difficulty:

After pumicing the rubbing varnish coats sponge off the surface with plenty of water making sure that all of the pumice is removed, and then chamois dry with a clean chamois. While the job is drying out make up a "tack rag" by dipping a piece of cheese cloth in some of the varnish and hanging it up to dry. It should be given about thirty minutes or so, depending on the varnish, of course, to dry sufficiently so that it becomes "tacky"—it must not be dry.

When the job is dry dust off thoroughly with a clean duster (keep duster washed out clean and use on no other work but this)—dust over twice to make sure of your work. Now go over the surface with the tack-rag, lightly, and it will pick up any lint or dust that remains. Blow on the finishing coat.

If there are any corners or cracks that might contain dirt which would work out on the brush while varnishing, make up a thin solution of white shellac and alcohol and with a small quill brush give these spots a light coating thus sealing the dirt in them.

In re-varnishing a job where the old finish has lost its life, rub down the old varnish with FF pumice powder, felt or heavy wool rag and water. Rub all over so that you have removed all scum and dirt, and have a uniformly dulled surface. Then proceed as above.

For this rubbing work a piece of felt can be used, head-lining from the top of an automobile, billiard table cloth, or any other heavy piece of wool cloth. Fold cloth into a pad of convenient size to fit the hand.

Law in Your Business

By Wellington Gustin



Dealer Not Liable for Latent Defects of Car

All That Is Required of Distributor Is an Exercise of Good Faith and Fair Dealing—Two Controlling Rules for Such Sales

A CONTROVERSY over the sale by sample of an automobile by a dealer to his customer comes from the Supreme Court of Washington. A dealer in Seattle sold a new car of a well known make, the model or sample of which he had on display in his showroom. It was conceded that the sale was not of a particular car, but of a particular model. The buyer operated the car after it was delivered to him for a period of approximately eleven months.

The car did not prove to be satisfactory and this suit was brought for the purpose of recovering damages for a breach of implied warranty. It should be here noted and remembered that the seller was not the manufacturer of the car, but simply a dealer. The car was defective, in that the pistons were a little too small for the cylinders.

The seller of the car claimed that, since it was a dealer, and not a manufacturer, in selling the car there was no implied warranty against latent defects. The buyer contended that, since he purchased, not a specific car, but a car of a particular model, even though the seller was a dealer, there would be an implied warranty against latent defects, such as ordinary inspection would not disclose. The defect in this case was latent, and one that ordinary inspection would not disclose.

Therefore, the question controlling was whether, under the facts stated, the seller as a dealer, was liable upon an implied warranty.

The Supreme Court found the decisions of the courts in the various states divided upon the question as to whether the dealer is liable upon an implied warranty for a latent defect in an article sold. In some it was found that the courts held that there is such an implied warranty. However, the majority of the courts held that in the case of the dealer, as distinguished from the manufacturer (there

Tell Us Your Legal Problems

SEEMINGLY knotty legal problems are constantly arising in the dealer's business, which even a slight knowledge of the law easily may solve. MOTOR AGE presents here the most common legal problems which confront the dealer. Mr. Gustin, a member of the Chicago bar, not only is well versed in the law relating to the dealer, but presents it in such a way as to be readily understood by the layman. In addition to his articles, Mr. Gustin will gladly answer such individual inquiries on knotty points as may be submitted to him.

is no such implied warranty. (L.R.A. 1915B, page 1131.)

The rule as laid down by the court is thus stated:

"* * * that, on a sale by a manufacturer, there is an implied warranty of fitness for the purposes intended, and of freedom from defects not discoverable by ordinary inspection and tests, while, on a sale by a dealer, there is not such implication, in the absence of a specific warranty to that effect. All that is required by a dealer is an exercise of good faith and fair dealing."

In the present controversy there was a sale of an automobile of known manufacture. The court points out that there is a rule collateral to the one just given, to the effect that where an article of

known manufacture is made by one not the seller, and the buyer knows this fact, there is no implied warranty by the dealer against latent defects. This rule is stated by the United States Circuit Court of Appeals, as follows:

"But where such a purchaser buys of a dealer a definite machine of known manufacture, which has been or is to be made by a builder, who is not the vendor (seller), and the vendor (buyer) knows this fact, there is no implied warranty by the dealer, either against latent defects or that the machine or article will be suitable for the purpose for which such articles are commonly used, because the purchaser has the same knowledge and means of knowledge of these subjects as has the dealer; the vendor knows that they both rely on the character and reputation of the manufacturer. (141 Fed.551.)

The buyer contended for and relied upon the rule that "where goods of some specific kind are ordered of the manufacturer or dealer, which the buyer has neither inspected nor selected, there is an implied warranty that the article delivered shall be of fair average quality or goodness according to its kind, and free from remarkable defects." (Mechem on Sales, Sec. 1340.) But the court held that this rule did not apply to the sales of well known makes of automobiles, because the conditions of the rule were not present. In such sales coming within this rule there is an "agreement by the dealer to supply an article not yet ascertained, but left to be determined by him according to his own judgment, in view of the purpose to be subserved by it as communicated to him by the buyer."

The court said in the instant case that there is nothing left to be determined by the dealer according to his own judgment, and his duty was fulfilled when he delivered a car of the particular model contracted for. Thus it did not come within this rule.

The Automotive Repair Shop

Practical Maintenance Hints

Sticking Valves

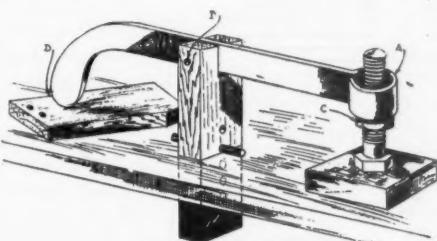
Sticking valves are not always due to bent, gummed, or carbonized stems. The trouble may be caused by other misplacements, such as a badly worn valve stem guide, which also may cause a good deal of other trouble.

In the first place such a condition will not permit the valve to seat properly; it is difficult accurately to grind the valve to a seat and it is almost impossible to adjust the carburetor owing to the excess of air that will be drawn through the guide and past the valve stem.

Look First to Valve Guide

When you imagine you have a sticking valve in a car which has been brought into the shop for inspection, look first to the valve guide and see that there is no excessive play between the stem and the guide, for if there is the valve stem is apt to bind at two points, the top and bottom of the guide on opposite sides, as shown in sketch.

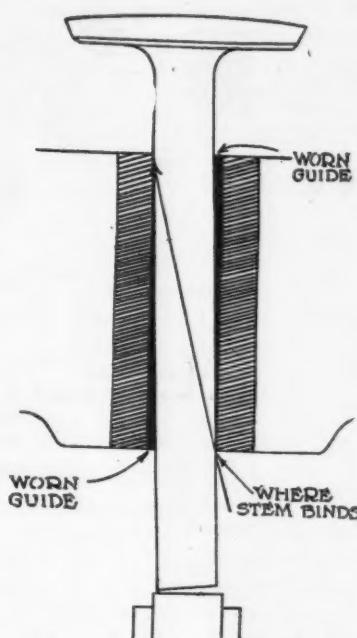
If you cannot secure valves with oversize stems, it will be necessary to bush the guide and then ream out the hole until it is true and will make a close fit for the valve stem after the latter has been ground for perfect trueness. It will not do, however, to fit only one valve this way. The entire set at least on one side should be so treated.



Simple Bench Clamp

A piece of 2 by 4 lumber, a short length of $\frac{1}{2}$ by 1-inch bar iron, an old brace will do, and a common long-threaded bolt is all the material required to make the handy bench clamp shown.

To make this tool one has but to give a little attention to its construction as shown in the sketch. The piece of 2 by 4 is used to make the vertical leg. A slot is sawed in the top end to take the clamp arm. Holes are bored in the leg at intervals to take the height-adjusting pin. The arm is easy to make. The piece of iron is heated and bent curved at the one end and bent around in a small circle at the other, as shown at A. A hole for the pin B is drilled in it. This completes all the work there is to making the clamp.



How a worn valve guide binds

Battery Terminal Sulphation

Much battery trouble is caused by the terminals not fitting into the battery bus bar snugly. This causes the sulphate deposits to collect in the battery terminal bearing area and make a very poor connection, offering considerable resistance to charging. In fact, a corroded battery terminal will cut down the charging rate about a third.

Usually this trouble is brought about by the terminal lock screw bottoming in its thread socket, making it impossible to pull the terminal up into the bus bar tight. To remedy this some shops merely put an extra washer under the lock screw, but this is only a makeshift, as when the car owner happens to visit another garage they invariably will throw away the washer as unnecessary, not knowing that it was placed there for a definite purpose. The real way to make a satisfactory repair in this case is to install a shorter screw or else cut off and shorten the one already in the terminal. This is a sure way of ridding the owner of his battery terminal trouble.

When installing a battery terminal it should be scraped free of all sulphate deposits both on the wire and bus bar connections. The application of a little vaseline on the connector bearing will reduce materially the possibility of sulphation and keep the resistance to charging off by this connection down to a minimum.

Safety Washers Prevent Bolt from Turning

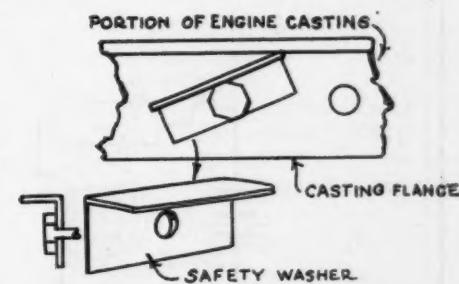
It requires two men to remove some of the bolts in taking out the Ford motor block. If a flange was formed in the casting to bear against side of bolt head then bolt would not turn while removing nut and one man could do the job.

The small devices illustrated can be made easily. A number of them may be drilled with the desired sized hole at one time and a small flange formed thereon after placing same in a vice. These devices need only be of sufficient length so one end will not pass a portion of casting body. John V. Loeffler, Evansville, Ind.

To Find Ground in Electric System

SIMPLE method of determining whether or not grounds exist in an electrical system is to remove one of the battery terminals and place a voltmeter in series with the battery and line. If the voltmeter shows a reading of more than 1 volt with no load on the line, this is an indication that the line is grounded at some point and that there is a consumption of current.

Provided the reading is more than 1 volt, and before starting to locate the place of the leak, turn on the light switch and see that the voltmeter gives



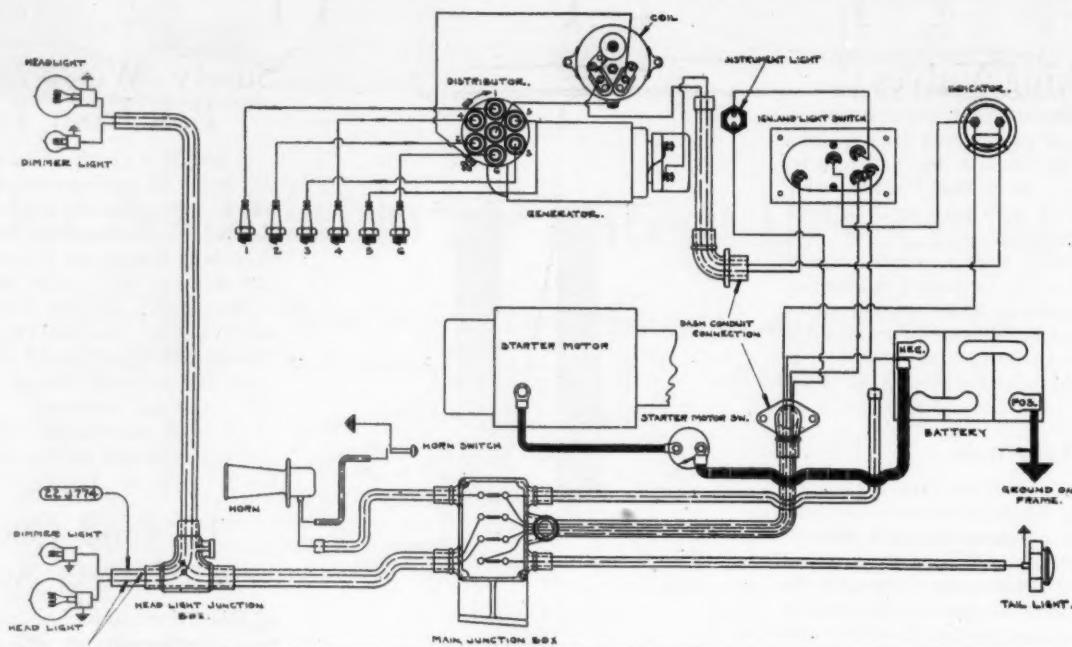
Washer to prevent bolt from turning

a reading equivalent to the full battery voltage across the terminals. Any readings less than 1 volt with no load on the line can be neglected, as these probably are caused by a moisture at the battery base.

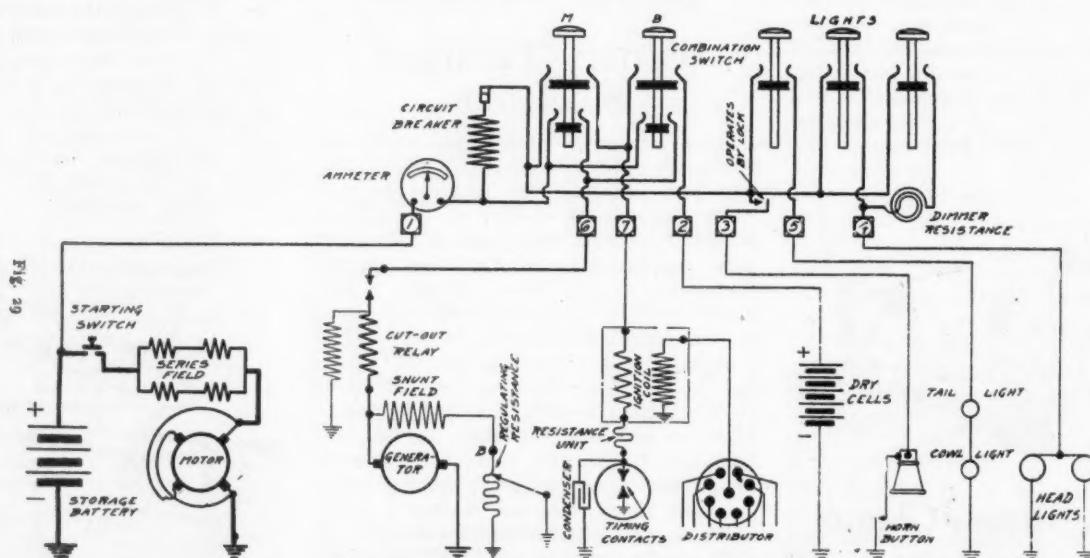
To prove that the system is free from grounds on either side of the battery line, place the voltmeter across the opposite battery terminal and short the other voltmeter lead to the frame. Next install the removed battery terminal in the battery bus bar to complete the circuit. If the voltmeter reading is not more than 1 volt, then the wiring system is free from grounds.

Motor Age Weekly Wiring Chart No. 113

1919 Velie 38—Remy System



1918 Cole 850—Delco System



Name of Car and Date on Which Wiring Diagrams Have Appeared in Previous Issues

Allen—June 17, '20
Sept. 30, '20
Auburn—Sept. 9, '20
Apperson—Aug. 5, '20
Buick—July 15, '20
Dec. 23, '20
Cadillac—Nov. 18, '20
Case—Aug. 5, '20
Oct. 7, '20
Chalmers—June 17, '20
Cole—Dec. 9, '20
Jan. 6, '21
Crow-Elkhart—July 29, '20
Davis—Aug. 12, '20
Doris—Dec. 9, '20

Dort—Aug. 12, '20
Dodge—Sept. 23, '20
Elcar—Oct. 28, '20
Dec. 2, '20
Elgin—Oct. 14, '20
Franklin—June 3, '20
Dec. 2, '20
Grant—Aug. 12, '20
Nov. 25, '20
Harroun—July 15, '20
Haynes—June 24, '20
Hudson—Jan. 13, '21
Jordan—June 10, '20
July 22, '20
Kissell—Aug. 19, '20
Oct. 21, '20

Lexington—July 29, '20
Dec. 16, '20
Locomobile—June 3, '20
Mitchell—Jan. 6, '21
Moline-Knight—July 22, '20
Nov. 4, '20
Moon—July 29, '20
Aug. 19, '20
Moore—Nov. 11, '20
National—Dec. 16, '20
Oldsmobile—Sept. 16, '20
Nov. 25, '20
Dec. 23, '20
Packard—Oct. 7, '20
Peerless—Nov. 18, '20

Pierce-Arrow—July 15, '20
Reo—July 22, '20
Roamer—Aug. 5, '20
Sept. 30, '20
Dec. 30, '20
Saxon—Sept. 9, '20
Oct. 21, '20
Dec. 30, '20
Scripps-Booth—Aug. 26, '20
Stearns—Nov. 4, '20
Jan. 13, '21
Stephens—Sept. 16, '20
Studebaker—July 1, '20
Oct. 28, '20
Stutz—July 8, '20
Willys-Knight—Oct. 14, '20

Radiators on 1920 Cars

Motor Age Maintenance Data Sheet No. 133

(Concluded from last week.)

One of a series of weekly pages of information valuable to service men and dealers—save this page

Name and Model	Radiator Make	Radiator Type	Water Circulation System	Name and Model	Radiator Make	Radiator Type	Water Circulation System
Crow-Elkhart	Jamestown	Honeycomb	.....	Norwalk, 430-KS	Standard	Cellular	.....
Cunningham, V4	Fedders	Honeycomb	Pump	Oakland, 34C	{ Fedders	Cellular	.....
Daniels, D19	G. & O.	Cellular	Pump		{ Long	Fin	Pump
Dodge Bros.	McCord	Tubular	Pump		{ Harrison	Tubular	.....
Dort, 15	Fedders	Cellular	Pump	Ogren, 6-60	Livingston	Honeycomb	.....
Dixie, H. S7000	Candler	Cellular	Thermo	Oldsmobile, 45B	Own	Cellular	Pump
Dorris, 680	Fedders	Cellular	Pomp	Oldsmobile, 37A	Harrison	Honeycomb	Pump
Elcar, D, H, G, K	Jamestown	Honeycomb	.....	Olympian, 45	Candler	Cellular	.....
Elgin, K.	Standard	Cellular	Thermo	Overland, 4	Own	Cellular	Thermo
Essex, A.	Harrison	Honeycomb	Thermo	Owen Magnetic, T60	G. & O.	Cellular	.....
Ferris, C20	Hooven	Cellular	.....	Packard, 335	Harrison	Honeycomb	Pump
Franklin, 9B	Air Cooled	.....	.....	Paige, 642	National	Cellular	Pump
Ford, T.	Own	.....	Thermo	Paterson, 650	Long	Fin & Tube	.....
Gardner, G.	Fedders	Honeycomb	.....	Peerless, 56, S6	Sparton	Cellular	Pump
Geronimo, A45	Jamestown	Honeycomb	.....	Piedmont, 4-30	Standard	Cellular	Pump
Grant, H.	Long	Tubular	Thermo	Pierce Arrow, 31 & 51	Fedders	Cellular	Pump
Hanson, 54 & 60	Long	Tubular	Thermo	Pan, A.	S. & J.	Cellular	.....
Harroun, AA2	Standard	Cellular	Thermo	Pilot.	Jamestown	Cellular	Pump
Halladay, M. S.	Kuenz	Heart Shape	.....	Porter, 46	Livingston	Honeycomb	Pump
Hatfield, A42	Jamestown	Cellular	.....	Premier, 6D	McCord	Cellular	Pump
Haynes, L. Six, 45	Fedders	Cellular	Pump	Reo, T6	Own	Tubular	Pump
Haynes, L. Twelve, 47	Fedders	Cellular	Pump	Reverse, Series F	.....	Honeycomb	Pump
H. C. S.	Fedders	Cellular	.....	Roamer, 654	M-W	Honeycomb	Pump
Holmes, 1921	Air Cooled	.....	.....	Rock Falls, 12	S. & W.	Honeycomb	.....
Hudson, 11-0	Harrison	Honeycomb	Pump	R. & V. Knight	Long	Tubular	Thermo
Huffman, R.	Livingston	Cellular	.....	Saxon, 125	Fedders	Cellular	.....
Hupmobile, R5	McCord	Cellular	Thermo	Sayers Six, D. P.	Fedders	Cone	.....
Jackson, 638	Long	Tubular	.....	Scripps Booth, B39	Harrison	Cellular	Pump
Jordan, M.	Sparton	Cellular	Pump	Seneca, 120	Kuens	Cellular	Thermo
King, H.	Mayo	Cellular	Thermo	Severin	Jamestown	Honeycomb	.....
Kline Kar, S. K.	Fedders	Honeycomb	.....	Skelton, 35	Jamestown	Cellular	.....
LaFayette, 134	Harrison	Cellular	.....	Spacke, 21	Air Cooled	.....	.....
Leach Biltwell	Eagle	Tubular	.....	Standard, 8	M-R	Honeycomb	Pump
Lexington, S.	Fedders	Cellular	Pump	Stearns	McCord	Honeycomb	Pump
Liberty, 10C.	Fedders	Cellular	Thermo	Stevens, Duryea, E.	G. & O.	Cellular	.....
Lincoln	Spec. Design	Tubular	.....	Stephens, 80	Fedders	Honeycomb	Thermo
Locomobile, S7	G. & O.	Cellular	.....	Studebaker, EJ	{ McCord	.....	.....
Lorraine, 20T	Perfex	Cellular	.....		{ Long	Tubular	Pump
Maibohm, B.	Perfex	Cellular	Thermo	Studebaker, EH	{ McCord	.....	.....
Marmon, 34B	McCord	Cellular	Pump		{ Long	Tubular	Pump
Marshall	.....	.....	.....	Studebaker, E. G.	{ Long	Tubular	.....
Maxwell, 25	Own	Tubular	Thermo	Stutz	Harrison	Cellular	.....
McFarlan, 147	Ansted	Tubular	Pump	Templar, 445	Fedders	Cellular	Pump
Mercer, Series 5	McCord	Cellular	Pump	Texan, A, B-38	Jamestown	Cellular	.....
Meteor, R. & R. R.	Ansted	Tubular	Pump	Tulsa	Jamestown	Cellular	.....
Metz, M. Six	Own	Tubular	Pump	Velie, 34	Jamestown	Cellular	Thermo
Mitchell, F40	Harrison	Honeycomb	Pump	Velie, 48	McCord	Cellular	Pump
Moon, 6-48	Fedders	Honeycomb	Pump	Westcott, C38	Fedders	Cellular	Pump
Monroe, S9-10	Fedders	Honeycomb	Thermo	Willys-Knight, 20	Own	Cellular	.....
Nash, 681-2	Long	Tubular	Pump	Winther, 61	M-R	Cellular	.....
National Sextett	Fedders	Cellular	Pump	Winton, 25	Fedders	Cellular	Pump
Nelson, E.	Candler	Cellular	Thermo	Wasp, 2011	Mayo	Honeycomb	.....
Noma, 1C	Livingston	Honeycomb	Pump	Westcott, C48	Fedders	Cellular	Pump

Abbreviations: M-R, Marlin Rockwell; S. & W., Sparks-Withington; S. & J., Shotwell & Johnson.

From the Four Winds

Glimpses at the World of Motordom

Business Notes

The Winther Motor Co., the Marwin Truck Corp., and the Kenosha Wheel & Axle Co., affiliated corporations at Kenosha, Wis., are preparing to resume production on a maximum capacity schedule by the end of this month in order to handle a large government contract amounting to more than \$3,000,000 and calling for 300 1½-ton and 75 3-ton trucks. All of the trucks will be of the quadruple drive type.

The Lanchin-Loehr Lubricating Piston Co., of Green Bay, Wis., has increased its capital stock from \$50,000 to \$150,000. It is engaged in increasing its capacity and has been in steady operation. New business is appearing in a most encouraging manner to fully occupy the additional capacity already provided and in contemplation.

The Badger Manufacturing Corp., Milwaukee, has leased a new factory building in that city in anticipating a quick return to normal conditions and will move its equipment from its present location immediately. It is hoped to have all the machinery installed and to be in complete production in the new plant by the end of January.

The Toledo Bridge & Crane Co. has filed suit in Toledo against the Maxwell Motor Co. for \$34,901.79 alleged due on a contract for the manufacture of 40,000 oil pans at \$2.50 each.

L. H. Gilmer Co., manufacturers of belting and woven products whose main plant is located in Tacony, Phila., have disposed of their Allentown plant, moving the machinery and equipment to their factory at North Wales, Pa., which plant has been expanded to take care of the additional equipment.

In increasing its capitalization from the original amount of \$500,000 to \$1,000,000 upon starting active quantity output, the Antigo Tractor Co. of Antigo, Wis., has reincorporated as the Antigo Tractor Corp. It recently purchased the foundry, machine shop and equipment of the Murray-Mylea Co. at Antigo and began production Jan. 10 under the direction of W. L. Carver, general manager, formerly of the Mid-West Engine Co., Indianapolis. F. H. Houck, formerly with the same concern, and C. R. Parrott, until now with the Universal tractor division of the Moline Plow Co., will be Mr. Carver's chief aides.

Exide Batteries of Canada, Ltd., will hereafter be the sole manufacturers of Exide batteries in Canada. The arrangement with the Chas. E. Goad Engineering Co., Ltd., has terminated. Headquarters have been established in Toronto.

For the fiscal year ending Dec. 31, 1920, sales of the Sewell Cushion Wheel Co., Detroit, manufacturers of resilient motor truck wheels showed an increase of 61 percent over sales of 1919.

The Stockholders of the Walden W. Shaw Corp., Chicago, at their annual meeting elected the following directors: John Hertz, John Borden, Charles A. McCulloch, Morris S. Rosenwald, Harold E. Foreman, John R. Thompson, Charles

W. Gray, John D. Towne, Harvey T. Woodruff, Milton A. Welment and Edward N. D'Ancona.

The C. G. Spring Co., Kalamazoo, Mich., has bought the assets and business of the U. S. Auto Bumper Co., Chicago, and will move the industry intact to the Michigan city. Another step in the expansion of the company is the opening of branch service and repair stations on Woodward avenue, Detroit, and at 3021 Michigan avenue, Chicago, to specialize in repairs to springs and replacements also in the installation of the new type bumpers. These stations will be under the supervision of D. M. Short who was associated with President Christian Groll during the latter's connection with the Perfection Spring Co. Fred R. Eaton, cashier of the Kalamazoo National bank, has been elected to the board of directors of the C. G. Spring Co.

In spite of financial depression, the C. R. Wilson Body Co. reports that it has passed the biggest year in its history during which it has expanded its plant to triple its former capacity, building additions and installing new equipment. At the annual meeting the directors authorized a 300 per cent stock dividend to go to all stockholders of record.

The Wolke Lead Batteries Co., Louisville, Ky., manufacturers of Red Cap batteries, are planning an extension of their business during the present year and increasing their capital sufficient to take care of their dealers over a larger territory. The company was organized two years ago by Albert Wolke. A distributing organization with branches in thirty large cities throughout the country directs the sales of the batteries through two thousand dealers and service stations.

COMING MOTOR EVENTS

Automobile Shows

Ardmore, Okla.	Annual Automobile Show.	January	Louisville, Ky.	Automobile Show	Feb. 21-26
Pontiac, Mich.	Annual Automobile Show.	January	Deadwood, S. D.	Annual Automobile Show	Feb. 21-26
Philadelphia	Automobile Show	Jan. 15-22	Salt Lake City	Automobile Show	Feb. 21-26
San Antonio, Tex.	Automobile, Truck and Tractor Show.	Jan. 15-23	Galesburg, Ill.	Annual Automobile Show	Feb. 22-26
Milwaukee	Annual Winter Show.	Jan. 17-23	Binghamton, N. Y.	Annual Automobile Show	Feb. 22-26
Oklahoma City	Automobile Show	Jan. 17-22	Malone, N. Y.	Annual Automobile Show	Feb. 23-26
Kalamazoo	Automobile Show	Jan. 18-22	Clinton, Iowa	Sixth Annual Automobile Show	Feb. 23-26
San Francisco	Automotive Equipment Exposition	Jan. 22-27	Newton, Kan.	Annual Automobile Show	Feb. 23-26
Baltimore	Annual Automobile Show	Jan. 22-29	Buffalo, N. Y.	Annual Automobile Show	Feb. 26-Mar. 5
Holyoke, Mass.	Annual Automobile Show	Jan. 22-29	Huskegon, Mich.	Automobile Show	Feb. 28-March 5
Cleveland	Annual Automobile Show	Jan. 22-29	Columbia, S. C.	Annual Automobile Show	March
Montreal	Nat'l Motor Show of Eastern Canada	Jan. 22-29	Schenectady, N. Y.	Automobile Show	March 1-5
Amsterdam, N. Y.	Annual Automobile Show	Jan. 23-29	Wilmington, Del.	Automobile Show	March 1-5
Columbus	Automobile Show	Jan. 24-29	Wichita, Kan.	Annual Automobile Show	March 1-5
Lawrence, Mass.	First Annual Show.	Jan. 24-29	Des Moines	Open Car Show	March 2-5
New Bedford, Mass.	Automobile Show	Jan. 25-29	Atlanta	Automobile Show	March 5-12
Chicago	Automobile Salon	Jan. 29	Des Moines	Closed Car Show	March 7-10
York, Pa.	Annual Automobile Show.	Jan. 29-Feb. 6	Indianapolis	Automobile Show	March 7-12
Chicago	National Passenger Car Show.	Jan. 29-Feb. 6	St. Joseph, Mo.	Automobile Show	Feb. 28-Mar. 5
Allentown, Pa.	Annual Automobile Show	Jan. 29-Feb. 12	Muskegon, Mich.	Automobile Show	Feb. 28-March 5
Lehigh, Pa.	Annual Automobile Show	Jan. 29-Feb. 12	Quincy, Ill.	Automobile Show	March 1
Hudson, N. Y.	Annual Automobile Show.	Jan. 30-Feb. 5	Brooklyn	Automobile Show	March 5-12
Oakland, Calif.	Automobile Show	Jan. 31-Feb. 6	Springfield, Mass.	Annual Automobile Show	March 7-12
London, Ont.	Nat'l Motor Show of Western Ontario, Jan.	31-Feb. 5	Scranton, Pa.	Passenger Car Show	March 7-12
Madison, Wis.	Annual Automobile Show.	February	Syracuse, N. Y.	Annual Automobile Show	March 7-12
Erie, Pa.	Annual Automobile Show.	February	Indianapolis	Automobile Show	March 7-12
Roanoke, Va.	Annual Automobile Show.	February	Newark, N. J.	Automobile Show	March 12-19
Paterson, N. J.	Annual Automobile Show.	February	Boston, Mass.	Annual Show	March 12-19
Amarillo, Texas	Annual Automobile Show.	February	Omaha, Neb.	Annual Automobile Show	March 14-19
Bucyrus, Ohio	Annual Automobile Show.	Feb. 2-5	Greenville, S. C.	Automobile Show	March 16-19
Tampa, Fla.	Annual Automobile Show.	Feb. 3-12	Torrtington, Conn.	Annual Automobile Show	March 20-26
Minneapolis	Annual Automobile Show.	Feb. 5-12	Chattanooga, Tenn.	Annual Automobile Show	April
Newberg, N. Y.	Annual Automobile Show.	Feb. 6-12	Bridgeton, N. J.	Annual Automobile Show	April 2-9
St. Louis	Passenger Car Show.	Feb. 7-12	Gloversville, N. Y.	Annual Automobile Show	April 3-9
Bridgeport, Conn.	Annual Automobile Show.	Feb. 7-12	Seattle	Automobile Show	April 4-9
Rochester, N. Y.	Automobile Show	Feb. 7-12	Buffalo	First Annual Motors and Sportsmen's Show, Apr. 11-16	
Reading, Pa.	Automobile Show	Feb. 7-12			
Yonkers, N. Y.	Automobile Show	Feb. 7-12			
Tulsa, Okla.	Annual Automobile Show.	Feb. 7-12			
Bucyrus, Ohio	Crawford County Automobile Show.	Feb. 9-12			
Hartford, Conn.	Annual Automobile Show.	Feb. 12-19			
Kansas City, Mo.	Annual Automobile Show.	Feb. 12-19			
Fitchburg, Mass.	Automobile Show	Feb. 12-19			
Winnipeg	Western Can. Automotive Equip. Show.	Feb. 14-19			
Trenton, N. J.	Annual Automobile Show.	Feb. 16-19			
Ottawa, Ill.	Automobile, Truck and Tractor Show.	Feb. 17-19			
San Bernardino, Cal.	Annual Automobile Show.	Feb. 18-28			
Albany, N. Y.	Annual Automobile Show.	Feb. 19-26			
San Francisco	Automobile Show	Feb. 19-26			
Pittsfield, Mass.	Annual Automobile Show.	Feb. 20-26			
Grand Rapids, Mich.	Automobile Business Association.	Feb. 21-26			

Tractor Shows

Columbus, Ohio	National Tractor Show	Feb. 7-12
Scranton, Pa.	Truck & Tractor Show	March 14-17

Foreign Shows

Delhi, India	Delhi Motor Car Show	Feb. 7
Strasbourg	French Grand Prix	July 23

Conventions

Chicago	N. A. D. A. Annual Meeting	Jan. 31-Feb. 1
Chicago	Automotive Elec. Service. Assn.	Feb. 2-4

Races

Indiaapolis Spwy	500 Mile Race	May 28
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